

**In the Supreme Court of the United States**

OFFICE OF THE CLERK

**OCTOBER TERM, 1991****CHEMICAL WASTE MANAGEMENT, INC., PETITIONER***v.*

GUY HUNT, GOVERNOR OF THE STATE OF ALABAMA;  
ALABAMA DEPARTMENT OF REVENUE; and JAMES M.  
SIZEMORE, JR., COMMISSIONER OF THE ALABAMA DE-  
PARTMENT OF REVENUE, RESPONDENTS

**On Writ of Certiorari to the  
Supreme Court of Alabama****JOINT APPENDIX****BERT S. NETTLES***Counsel of Record***ALTON B. PARKER, JR.****J. MARK HART***Spain, Gillon, Grooms**Blan & Nettles**2117 2nd Avenue North**Birmingham, AL 35203**(205) 328-4100**Counsel for Respondent**Hunt***WILLIAM D. COLEMAN***Counsel of Record***JIM B. GRANT, JR.***Capell, Howard, Knabe  
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\* The decision of the Supreme Court of Alabama and the decision of the Circuit Court of Montgomery County are set forth in the appendix to the petition for a writ of certiorari and have not been reproduced.

SUPREME COURT OF ALABAMA  
SPECIAL TERM, 1991

1901043

GUY HUNT, as Governor of the State of Alabama

v.

CHEMICAL WASTE MANAGEMENT, INC.

1901044

JAMES M. SIZEMORE, JR., as Commissioner of the  
Alabama Department of Revenue; and the  
ALABAMA DEPARTMENT OF REVENUE

v.

CHEMICAL WASTE MANAGEMENT, INC.

1901106

CHEMICAL WASTE MANAGEMENT, INC.

v.

THE ALABAMA DEPARTMENT OF REVENUE, *et al.*

**RELEVANT DOCKET ENTRIES**

DATE	FILINGS—PROCEEDINGS
1991	
April 5	Case docketed
April 16	CWM files cross appeal
June 13	Case argued and submitted
July 11	Opinion by Justice Shores issued; certificates of judgment issued

IN THE CIRCUIT COURT  
OF MONTGOMERY COUNTY, ALABAMA

Civil Action No. CV 90-1098

CHEMICAL WASTE MANAGEMENT, INC., PLAINTIFF

*v.*

THE ALABAMA DEPT. OF REVENUE; JAMES M. SIZEMORE, JR., as Commissioner of the ALABAMA DEPARTMENT OF REVENUE; GUY HUNT, as Governor of Alabama; CLAUDE EARL FOX, M.D., M.P.H., as State Health Officer; and the STATE BOARD OF HEALTH, DEFENDANTS

RELEVANT DOCKET ENTRIES

DATE	FILINGS—PROCEEDINGS
1990	
May 31	CWM files complaint challenging Additional Fee and Base Fee.
July 5	Defendants Sizemore and Alabama Department of Revenue file Answer to Complaint.
Aug. 13	Defendant Sizemore files Amendment to Answer.
Aug. 29	Defendant Hunt answers complaint and files counterclaim seeking determination of validity of Cap Provision.
Sept. 6	CWM files First Amendment To Complaint.
Oct. 3	CWM answers Defendant Hunt's counterclaim.
Oct. 15	Defendant Hunt files Amended Answer to Complaint.
Oct. 15- Oct. 18	Trial before Judge Phelps.
1991	
Feb. 28	Findings of Fact and Conclusions of Law, Order and Injunction filed.
April 2	Defendants Hunt and Sizemore file notices of appeal.

ORAL ARGUMENT ON MOTIONS

July 12, 1990

\* \* \* \*

[R. 309] BY MR. NETTLES: Yes, sir. So, what the State is saying, we want to do two things, and we'll go through the findings of fact but just—the Legislature, at least, and the Governor have said we have these concerns, very explicit concerns, four pages of them and we want to do two things; we are going to make it more expensive for people to send it in because we want to decrease the amount of waste coming in, one. And number two, have some money from what does come in, to help us with, among other things, Sumter county but also for the health department.

BY THE COURT: They said you need to treat the in-state people the same same way.

BY MR. NETTLES: That's right, but you don't. We are going back to Maine, we are also going back to several other cases that we cited in brief, and while we are staying on the law, let me refer back to the brief because there are other case as well, older cases that didn't deal with hazardous wastes.

BY THE COURT: Before I lose you on this, do you say, or does the Legislature say that these out-of-state users are using up a resource of Alabama?

[R. 310] BY MR. NETTLES: That's part of it, that's part of it, Your Honor. That this is a—they say it's one of the best—the Selma chalk is one of the best structures for the burial of this waste anywhere.

Now, there are a lot of other possible sites as well that are as good or better than, but those other sites have not been developed. Back in the late seventies, Emmelle was opened about four years or so, it was receiving this, and not much was said or done about it, and then it's just continued to grow, but it hasn't grown—hasn't been developed in other states.

Now, Your Honor can refer to the brief, you have the brief before you, if you would turn to page eight, and

this deals with a case, I believe it was Mr. Justice Scalia explaining the opinion of the court, and in that case, although he found against the government institution in that case, Limbach, who was Commissioner of Revenue, I think in Ohio, that he never,—the court, Mr. Justice Scalia explained, our cases leave open the possibility that a state may validate a statute that discriminates against interstate commerce by showing that it advances a legitimate local purpose [R. 311] that cannot be adequately served by reasonable non-discriminatory alternatives. Sort of like a products liability case.

BY THE COURT: You go back to Maine, I guess.

BY MR. NETTLES: Yes, sir. This is perhaps just another way of saying that what may appear to be a discriminatory or facially discriminatory provision in the Constitution that prohibits it, since that is a protectionist enactment, may on closer analysis may not be so. And that's what we say, you read those two cases together.

BY THE COURT: You say that this court has to look at the act and the purpose and look towards why.

BY MR. NETTLES: And the facts, yes, sir. What we are saying, like Mr. Justice Scalia, we are saying that our purpose cannot be adequately served by reasonable, non-discriminatory purposes. How can we discourage other people from sending their hazardous waste down here and increasing the already four million tons of hazardous waste, without the total ban? But there's no other way to discourage them. Either a [312] total ban which might well be unconstitutional, or create problems for the entire country as well as Alabama, or with a tax.

BY THE COURT: As I understand the plaintiff's argument, for a rational,—a rational basis doesn't make any difference. The test says I am required to invoke is whether or not it's a different treatment, and if it is, the whys don't make any difference? Is that what he said?

BY MR. NETTLES: Yes, sir, but that's wrong.

BY THE COURT: I'll let you come back on that, but I understand the rationale is not properly before me.

BY MR. NETTLES: The rationale, Your Honor, is because of the—the scintilla, or whatever the substantial reason,—not scintilla, but the findings of the fact of the Legislature, the legislative findings as we set out, we cite two Alabama Supreme Court cases holding that legislative findings are entitled to weight.

BY THE COURT: Well, he says that doesn't make any difference. That if you tax an out-of-state user any amount at all more than you [R. 313] tax an in-state user, it's per se violative of the Commerce Clause.

BY MR. NETTLES: Yes, sir, that's what I heard him say, too, and that's what the record will reflect and Mr. Justice Scalia says differently. If you read—

BY THE COURT: What kind of case was that?

BY MR. NETTLES: That was not a hazardous waste case, if I recall. It was something else, Your Honor.

BY THE COURT: If it was a hazardous waste case, you would recall it, right?

BY MR. NETTLES: Yes, sir, yes, sir. But it's good enough when you read with it the State of Maine, plus with the City of Philadelphia.

Your Honor, in other words, what we have here is a situation of has the Alabama Legislature advanced a legitimate local purpose that cannot be adequately served by reasonable, non-discriminatory alternatives.

\* \* \* \*

**LIST OF STATES AFFECTED BY ALABAMA ACT 89-788**

States Not Affected by Act 89-788 Effective on Published Date	States Banned Because of Lack of Commercial Treatment or Disposal Facilities	Effective Date of Ban	States Banned Because of Lack of Response to Alabama's Request for Information	Effective Date of Ban
Arkansas	Alaska	09/14/89	Oregon	09/14/89
California	Arizona	09/14/89	Washington	09/14/89
Colorado	Delaware	09/14/89	U.S. Virgin Islands	10/19/89
Connecticut	District of Columbia	09/14/89		
Georgia	Florida	09/14/89		
Idaho	Hawaii	10/19/89		
Illinois	Kansas	09/14/89		
Indiana	Maine	09/14/89		
Iowa	Mississippi	09/14/89		
Louisiana	Missouri	09/14/89		
Kentucky	Montana	09/14/89		
Maryland	New Hampshire	09/14/89		
Massachusetts	New Mexico	09/14/89		
Michigan	North Dakota	09/14/89		
Minnesota	Puerto Rico	10/19/89		
Nebraska	South Dakota	09/14/89		
Nevada	Vermont	09/14/89		
New Jersey	Virginia	09/14/89		
New York	West Virginia	09/14/89		
North Carolina	Wyoming	09/14/89		
Ohio				
Oklahoma				
Pennsylvania				
Rhode Island				
South Carolina				
Tennessee				
Texas				
Utah				
Wisconsin				

Hazardous waste prohibited from banned states includes RCRA and CERCLA wastes.

The list of banned states has been revised to remove North Carolina from the banned list. The Governor of Alabama has signed an interstate agreement with the Governor of North Carolina. The agreement allows North Carolina to send hazardous waste to Alabama for land disposal.

Revised List Published: January 8, 1990

/s/ Leigh Pegues  
**LEIGH PEGUES**  
 Director  
 Alabama Department of  
 Environmental Management

1-9-90  
 Date

Dec. [Illegible]

**TESTIMONY OF RODGER HENSON**

\* \* \* \*

[Tr. 48] Q. Is there any difference among nonhazardous and hazardous waste based upon the state where they are generated or created?

A. There is no difference.

\* \* \* \*

[Tr. 64] Q. I think we will pick up where we were at lunch. As I understand it, you had testified that you take hazardous waste and then solidify it or treat it and then render it nonhazardous before or when you place it into the trench; is that correct?

A. That is correct. That is with some waste.

Q. Possible with some waste, but not all waste?

A. Not all waste.

Q. And would you agree then with the statement that although some wastes degrade or can be less hazardous through treatment, some substances remain hazardous forever?

A. I would agree with that.

\* \* \* \*

[Tr. 83] Q. And incidentally is it not correct that approximately 40,000 truckloads of hazardous waste came into Emelle last year?

A. I don't know if that is the number or not.

Q. If you take 20 tons on the average truck?

A. 20 tons a truck.

Q. 780,000, almost 800,000, and you multiply that out, would you get 40,000 truckloads of hazardous waste?

A. Is that how it divides out?

Q. Yes. We had a large complicated set of figures with Mr. Hanley, and that is what it came out.

A. If you take 780,000 tons of waste and divide that by 20 tons per truck you get the number of trucks.

\* \* \* \*

[Tr. 102] Q. I will ask you to read with me on page 4, paragraph D, reading your lawyer's language, and you

will recognize the first few words of that, "Without the unconstitutional restrictions discussed above, the total annual demand for disposal capacity at the Emelle facility for hazardous waste generated out of state is projected to increase annually". Do you agree with that statement of your lawyers?

A. I agree.

Q. So, without the cap, without the additional fees, you project that total annual demand for disposing capacity there at Emelle would increase for hazardous wastes generated out of state annually?

A. To a point. There are some points somewhere in the future where it won't.

Q. I believe you stated in deposition that you see a hundred years of operation there at Emelle?

[Tr. 103] A. I stated in my deposition at the current rate I believe the facility would last 100 years, at least.

Q. Now, isn't it correct—I believe you said toward the end of your testimony this morning that with respect to—you were taking two situations, asked about what happens on cleanup costs. We see a lot of cleanup of hazardous waste from the government, Judge, or whoever mandates that it be removed, and a lot of that is coming to Emelle, is that correct?

A. Right.

\* \* \* \*

[Tr. 113] Q. Now, is it not correct that you have monitoring facilities that will have to be maintained indefinitely, or shall we say forever?

A. Monitoring facilities?

Q. The 70 monitoring wells already in place at Emelle, for example?

A. Those wells will be monitored in perpetuity.

Q. Yes, sir. And that monitoring in perpetuity, by definition, will extend well beyond 30 years?

A. It will.

Q. And likewise is there not going to be a requirement that continued safety desirability, environmental

desirability factor to maintain the pumping out of the leachate and hauling, gathering, storing and disposal of leachate from this trench 19 and eventually trench 21, and from these other trenches yet to be built?

A. Yes, sir.

Q. And that gathering, collection, storage, transportation and disposal of leachate will have to be maintained in perpetuity?

A. Yes, sir.

Q. Again, by definition, beyond 30 years?

A. Yes, sir.

Q. And isn't it a fact that the premises there at Emelle [Tr. 114] where you have the monitoring, where you have the pumping out of leachate, will have to be maintained and secured in perpetuity?

A. Yes, sir.

Q. For which there will be some expense?

A. Some.

Q. In fact, all of those things that we have described, the continued monitoring, the continued pumping, the gathering and collection and hauling away and disposal of leachate, and the security maintenance of the facility will have to be maintained at some expense in perpetuity?

A. That's correct.

Q. Now, obviously you have some 50 acres in use at the present time, and assuming, shall we say, some annual increases and operations for a hundred years, you are talking about far more than 50 acres on down the road being placed in active operation?

A. Yes.

Q. And the greater the facility, the larger the facility, the larger the cost eventually in perpetuity?

A. That's correct.

Q. And is it not correct to say that the larger the facility the more millions of tons of hazardous waste brought in and left there forever, whatever risks there are likewise will increase?

[Tr. 115] A. Well, I get—when you talk about risks, what I am maintaining is that you are not increasing

your risk anymore by the more material that you bring in and put in the Selma chalk.

Q. That is your testimony?

A. Yes, sir.

Q. That you can dig another hundred trenches the size of trench 21 or trench 16, that we saw in the photograph, and not increase the risks?

A. It is my opinion you won't, because of the integrity of the chalk.

\* \* \* \*

[Tr. 116] Q. So what we have here with the operation of this ChemWaste facility at Emelle and Selma chalk, all of this is based upon an inexact science?

A. In my view. The only thing that is inexact about it is the measurement of migration through chalk. You've got people that are saying 310 years it would take to penetrate the chalk. You have other people saying a million years, and you have people saying 10,000 years. It is somewhere in there somewhere, is what I am saying.

Q. It is going to leak?

A. The migration potential through that chalk is inexact.

\* \* \* \*

[Tr. 120] Q. And ChemWaste has the responsibility should anything go wrong, it also has the similar responsibility for the present, certainly for the 30 years under the EPA guidelines, for anything that might go wrong in Louisiana, or at these other five facilities?

A. That's correct.

Q. So, if there were a natural disaster in Louisiana or Texas, or one of these other facilities, hazardous waste facilities, ChemWaste would be responsible for that; is that not correct?

A. If they own the facility, that's right.

Q. Yes, sir. Speaking of disasters, do you have any plan with respect to what if an earthquake comes through there?

A. No.

\* \* \* \*

[Tr. 123] Q. Relating to this morning, I think you mentioned most of the Fortune 500 companies ship hazardous waste to the Emelle facility for landfill burial?

A. Many of them do.

Q. I think you said most.

A. I might have; most, many, some, a lot.

Q. Most and some, in any event let's just say with that, [Tr. 124] most, some, or a lot of Fortune 500 companies send to Emelle their hazardous waste. Most of those companies, most of that waste from those companies is generated outside of Alabama?

A. Yes, sir.

THE COURT: Excuse me. Is there a similar site in Alabama, a similar disposal site, to ChemWaste, to Emelle?

A. No, sir. We are the only commercial disposal site in the state.

THE COURT: You don't have an in-state competitor?

A. No, sir.

\* \* \* \*

[Tr. 132] Q. Now, is Emelle the largest landfill, hazardous waste operation, anywhere in the entire country?

A. In land size, yes.

Q. And, in fact, do you know of any in the world as large as Emelle?

A. I don't. I am not familiar with every facility in the world.

\* \* \* \*

Q. You are not aware of any landfill operation larger than the Emelle facility anywhere in the world; are you?

A. I'm not aware of any.

Q. During the video tape we heard—this is just to clarify—I think it said on the tape that the number of acres at Emelle was, I believe, 2400 acres, and your testimony [Tr. 133] was like 1700 acres?

A. No; it was 2700. We have acquired 300 more since the tape was made.

Q. You may have said 1700 but you meant to say 2700?

A. I meant 2700.

Q. That is the size of the Emelle facility?

A. (Witness nods head up and down.)

Q. One of the first things brought out in your testimony today was the location of Emelle. It is a rather rural area; isn't it?

A. It is.

Q. And this landfill is actually located between Emelle and Geiger?

A. That's correct.

Q. In this particular facility over there is that one of the reasons it was chosen, because it was a very sparsely populated area?

A. It was chosen because of geology, number one; and the second consideration was it was chosen because it was for sale.

\* \* \* \*

[Tr. 156] Q. Would anything coming out of any one of those be considered leachate?

A. Yes. Materials pumped out of this pipe that is above both of the liners would be considered leachate.

THE COURT: You are getting that now?

[Tr. 157] A. Yes, sir.

Q. Where is this water coming from?

A. It is rainfall. When this trench is open and we are disposing of things inside it, and it rains on it, the water trickles down through, hits the synthetic liner, hits the gravel, and flows through that pipe into the pump and we pump it out.

THE COURT: What do you do with it?

A. It is stored on site in a tank and then we ship it to Texas for disposal.

Q. Why do you ship it to Texas for disposal instead of disposing of it on site?

A. Because there is a deep well injection facility in Texas, that we don't have. The only thing we could do would be solidify it and put it back in the trench.

Q. Are there any deep well injection facilities in the state of Alabama?

A. I don't know whether there are any of those still operating privately or not. I know there is not a commercial one.

Q. There is not one that would take it?

A. There is not one in Alabama that would take our stuff.

Q. If I can describe it as a regular landfill, do the county landfills generate leachate?

A. I am certain they do.

[Tr. 158] Q. What about industrial landfills that accept industrial nonhazardous waste?

A. Any landfill that is operated in anyplace where it rains generates leachate.

THE COURT: Do you have a different category for that leachate? Do you have hazardous and nonhazardous?

A. The leachate that is collected because of rainfall in a hazardous waste facility is, by definition of EPA, a hazardous liquid. The leachate generated in a landfill may or may not be hazardous, depending on what they put in the garbage landfill.

Q. So the leachate from a garbage landfill could be hazardous?

A. It could have hazardous characteristics, depending on what went in that garbage landfill. It is not defined as hazardous as a TSD facility under RCRA.

A. It is a hazardous waste landfill, transportation storage facility.

\* \* \* \*

#### TESTIMONY OF SUE ROBERTSON

[Tr. 194] Q. Good morning, Ms. Robertson. Would you state your full name for the Court, please?

A. Sue R. Robertson.

Q. Where do you live?

A. I live in Wallsboro, Alabama.

Q. By whom are you employed?

A. The State of Alabama, specifically the Alabama Department of Environmental Management.

Q. In what capacity?

A. I am Chief of the Land Division, which is responsible for regulation of hazardous and solid waste.

Q. Would you please give the Court a brief summary of your educational background?

A. I have a B.S. Degree in Chemical Engineering from the University of Alabama. I have a Master's in Chemical [Tr. 195] Engineering from Georgia Tech. I have been employed with ADEM or its predecessors for the past 18 years.

Q. And are you a registered professional engineer?

A. Yes, in the state of Alabama.

Q. In the state of Alabama. When did you receive that designation?

A. 1977.

\* \* \* \*

[Tr. 205] A. EPA has, through their regulatory process, classified for about 455 chemicals, specific chemicals or listings as being hazardous. In addition, they have other characteristic procedure which says that if a waste [Tr. 206] is corrosive or if it is reactive, or if it is ignitable, or if it fails a test procedure, which was referred to as an EPA tox, but now there is another test procedure that replaced that called the toxic characteristic leaching procedure, which you will hear a lot of people refer to as TCLP. This covers an enormous range of chemicals, and Chemical Waste Management, through the Part B permit and their interim status, can landfill or can manage virtually all of those different chemicals. In addition, Chemical

Waste Management is permitted to manage PCBs or polychlorinated biphenyls. And, in addition to that, they are also permitted to take CERCLA waste, which is cleanup waste that Dr. Henson referred to yesterday, and these could encompass an even wider range of chemicals that are of concern under the Clean Water Act or the Air Act. So, there is a very broad range. These chemicals are again determined to be hazardous, because they might be reactive. That means if they are mixed with other chemicals there would be a reaction. Ignitable at other facilities in the early '70s in the past, drums would explode and the storage facility would catch on fire. And there's been some large contamination and resulting cleanups from that type incidents. Corrosive—if corrosive material would eventually eat through some [Tr. 207] storage containers, then that would allow them to perhaps react with other chemicals it was stored with, and then they are toxic. A large percentage of the chemicals are listed as being hazardous because they are toxic. They have been determined to be carcinogenic and mutagenic, and have impact on human health.

\* \* \* \*

[Tr. 216] A. \* \* \* But there is also concern about long term, and there are some very hazardous compounds that are landfilled there that are considered to be hazardous because of their effect on human health, that there were studies or [Tr. 217] actual verification that these compounds when it got into the ground water caused cancer, caused malformed babies, caused miscarriages, et cetera; so I would say there are two types of concerns, the sudden, which would be ignitable waste that Dr. Henson talked about, and then the long term, which would be the cancer causing agents that could get into the water table.

\* \* \* \*

Q. Ms. Robertson, we were talking about the differences between a gasoline truck which would be going to the gasoline station and other trucks with flammable

liquids which may be destined for treatment at Emelle. Are the types of liquids contained in those trucks intended for treatment at Emelle, are they of the same type ignitable characteristics that the gasoline truck would be?

A. Part of them would be, yes.

\* \* \* \*

[Tr. 219] Q. Now, tell me, if you will, what are some of the more hazardous wastes that are stored at Emelle, please, ma'am?

A. Stored or landfilled?

Q. Landfilled at Emelle. I'm sorry.

A. Well, again, PCBs are landfilled at Emelle in large amounts. They are considered hazardous. You have a large amount of plating waste that goes to Emelle. Those are contaminated with metals such as lead, cadmium, chrome, cyanide suppressant are present many times in plating base, and those can be released. If they are released in a gaseous state, they are considered fatal to humans in concentrations as low as, I believe, three or 400 parts per million. So, metals are considered to be pretty much prevalent. Once they are disposed they stay as metals in the environment, and some of them have high solubility in water, or cyanide, and would move into the water table if an opportunity presented itself.

Q. You mentioned a minute ago when I asked you a question about storage of these wastes at Emelle, and you asked me if I meant landfilled. With respect to materials that are landfilled at the Emelle facility, how long is it anticipated that those materials and wastes will [Tr. 220] be landfilled there?

A. Chemical Waste Management, in their closure plan, intends to cap that waste that is landfilled, and that it will be left there forevermore.

Q. And these wastes that are capped in the landfill in Alabama forever will require what type of, in general terms, continuous regulatory activity?

A. On any particular regulatory, on my part, or maintenance on their part?

Q. Both. I'm sorry.

A. Okay. I will continue to have to regulate that facility even in a closed state to insure that ChemWaste is doing what is required under the post closure provisions. When you get a permit, which is referred to as a post closure permit when a facility is closed with waste in place, that post closure permit would require that ChemWaste maintain the cap so that water or liquids do not permeate the cap, get in the landfill and cause possible ground water contamination, requires that monitoring be carried out on a periodic basis; and at the present, those requirements would be for 30 years after they close the facility or the landfill.

THE COURT: Continuing regulation for 30 years?

A. Yes, sir.

THE COURT: Why are you able to stop at the end [Tr. 221] of 30 years?

A. The federal law or EPA specified that that was all that is required, that 30 years; but in actuality, the waste will be there and there will still have to be monitoring of some sort that will go on at that facility forever, because the waste will be there forever, and the longer the waste is there the greater the probability that the liners may deteriorate and that there might be contamination.

\* \* \* \*

[Tr. 241] Q. Now, are those, all of those that you just read, fire, explosion, spills, and materials release, and accidents, they have listed there under emergencies inherent to [Tr. 242] closure operations?

A. That's correct.

Q. Are those all risks that are attendant to handling, managing and landfilling hazardous waste at the Emelle facility?

A. Yes.

Q. In your judgment, is that risk increased by increased volumes of hazardous waste that is managed, stored and landfilled at that facility?

A. Yes.

Q. Look at paragraph 1.4.2 under natural events, please, and tell the Court what ChemWaste says are natural events which are potential facility emergencies.

A. There are potential facility emergencies which could result from acts of God, including major climatological, geophysical or other natural events, such as heavy rains and surface runoff, tornadoes, heavy winds and forest fires.

Q. Is there any mention of earthquakes in that?

A. No.

Q. And with respect to those natural events which are potential emergencies that could occur at or around the Emelle facility, is it your judgment that the risks attendant to those would be increased based on the increased volume that is stored and landfilled at that [Tr. 243] facility?

A. Yes.

Q. I will ask you, Ms. Robertson, has it recently come to your attention that an earthquake did actually occur in Sumter County in 1886?

MR. WELLS: We will stipulate that there was an earthquake 104 years ago in Sumter County. I don't think we need to ask every witness.

MR. PARKER: We will accept the stipulation.

\* \* \* \*

Q. ChemWaste's contingency plan does not address the potential for earthquakes; does it?

A. No, it doesn't.

\* \* \* \*

[Tr. 251] Q. You mentioned earlier the newly permitted BFI landfill at Last Chance, Colorado. I ask you are there any landfills which have been started and permitted since RCRA came into existence in November of 1980 for hazardous waste?

A. No. Last Chance is the only green field site, which [Tr. 252] means there was nothing there before they came in and put a landfill there.

Q. All of the other hazardous waste landfills operated and preexisted the effective date of RCRA?

A. They came in under interim status meaning they made that demonstration that they were accepting hazardous waste and they, therefore, got a Part A permit and didn't go through getting a Part B, as the green field site.

MR. PARKER: Your Honor, do you understand what the green field site means? You might explain that, if you would.

A. When you refer to a green field site it means that there was nothing but grass there before, and that there was nothing there, and you came in and put some type of industry there.

Q. Now, with respect to Last Chance, Colorado landfill, which is the only permitted landfill, which is a green field site, since RCRA, how much waste has been introduced into that landfill?

A. None. It became operational or could have been operational in the spring of this year. BFI made the corporate decision that it would no longer manage hazardous waste; and, therefore, put up for sale all of its hazardous waste facility, so this facility was [Tr. 253] never operated and is for sale.

Q. Has it been sold at the present time, to your knowledge?

A. No.

\* \* \* \*

[Tr. 298] Q. Have you reviewed the records of ADEM to determine what spills have occurred on site at Emelle?

A. Yes.

Q. And would you please tell the Court, or summarize, those spills, the dates and types of spills they were?

A. On October 4, 1984, a solution with a pH greater than 13 was placed in the RCRA surface impairment number 3, which contained a low pH sludge. The comingling of these wastes resulted in an orange colored

atmospheric emission being emitted. On August 18, 1985 there was a hazardous waste spill, which occurred on site, which contaminated an area of on site soil. Efforts to contain this spill weren't effective and there was off site contamination. ChemWaste indicated that equipment failure caused the release. On April 4, 1986, 50 gallons of waste acid were spilled on the ground during the loading of a tanker when the acid apparently caused the tanker walls to fail. On September 17, 1987, approximately 30 gallons of solvent waste was spilled when a tanker hose failed and contaminated on site soil. On March 22, 1989, a truck driver released a 10,000 pound load of ash with less than 500 ppm, PCBs on a paved parking lot. On August 31, 1989, 55 gallons of D001, F003, and F005 spilled from leaking drums on [Tr. 299] a paved parking lot.

Q. Are those listed hazardous wastes with EPA code numbers?

A. Yes.

Q. Go ahead.

A. On September 14, 1989 approximately 70 pounds of D008 waste spilled from a truck at the ChemWaste scales. On September 1st, 1989, one gallon of F006 hazardous waste leaked onto the pavement at the site when a truck was parked on an incline. On October 13, 1989, 20 gallons of F003 and F005 and D001 hazardous waste spilled on facility soil. On November 3, 1989, 25 gallons of D002 and K062 leaked from a truck at the facility. On November 8, 1989, 10 gallons of D007 and D008, spilled from a truck tailgated at the facility. On December 5, 1989, two gallons of D001 and F02 and F005 were spilled from an unsecured lid on a tanker truck. On December 13, 1989 approximately 20 gallons of listed waste spilled from a tanker at the solvent recovery area. On December 29, 1989, approximately 15 gallons of flammable liquid was spilled on the pavement from a tanker when the top vent was not secured. On January 16, 1990, two gallons of liquid from site D004 and D004 hazardous

waste spilled from the rear of a rolloff. In the spring of this year there were some brominated tablets put into the trench and came in contact with [Tr. 300] some moisture and caused a release, an orange colored cloud release also.

Q. Now, with respect to all of those spills that have occurred on site, that you have just identified, were all of those spills remediated by ChemWaste?

A. Yes, they have.

Q. Now, I notice that beginning from 1984 to 1989 there were—I'm sorry. '84 up through the beginning of '89 there were four spills that were reported. Since '89, there have been one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, by my count, that you have reported. Is that approximately correct?

A. Yes.

Q. And how does the incident of spills correlate, if it does, with the increase in the volumes that have been disposed of at Emelle?

A. Well, the volumes managed on site have increased since 1985.

\* \* \*

[Tr. 301] Q. And accordingly then what—is there a difference between the volumes of out-of-state waste that are disposed of at Emelle and the volumes that are disposed of in state?

A. The majority of waste managed at Emelle, according to the records provided by ChemWaste, according to Dr. Henson's testimony, is from out of state.

Q. And that is the 85 to 90 percent we have been talking [Tr. 302] about?

A. That is correct.

Q. Is there any reason to believe that those percentages will not continue to hold true with respect to volumes that are disposed of at Emelle in the absence of the Fee Act which has been enacted, which is in litigation today?

A. As I previously discussed, the number of landfills are decreasing every year. Some of these landfills have caps placed on them. The only one that has been cited within the last 10 years is the Denver, Colorado facility, which has a cap. The trend is that there are fewer and fewer landfills that can handle this waste. There are landfills that are going to be filled up within the next few years. The GAO reports indicate that EPA just doesn't have any idea or good data on the amount of CERCLA waste that will need to be cleaned up and properly disposed of, that they don't have a good feel on the amount of hazardous waste that will eventually be declared to be hazardous waste. And so, even though you have the land ban restrictions and that will minimize untreated waste going to the landfill, you still have these forces that are going to increase the amount of waste that can be hazardous and at the same time the amount of waste, the amount [Tr. 303] of permitted disposal sites is decreasing; so, the law of supply and demand would indicate that the waste would still, the amount of out-of-state waste, would still be at least the 85 to 90 percent number, if not greater.

\* \* \*

[Tr. 305] Q. And shown on that chart would you explain what the volumes are since 1985 at the Emelle facility?

A. Well, as the bar chart indicates, in 1985 ChemWaste received 341,000 tons of waste. These are approximate numbers rounded off. In 1986 they received 456,000 tons. In 1987 they received 564,000 tons. In 1988 they received 549,000 tons of waste. In 1989 they [Tr. 306] received 791,000 tons of waste. And through August of this year they have received 480,000 tons of waste.

\* \* \*

[Tr. 310] Q. What effect, if any, have the increased volumes of disposal at Emelle, not disposal but landfilling

of waste at Emelle had on ADEM's ability to monitor and otherwise perform its obligations at the Emelle facility?

A. When Emelle was accepting very large tonnages per month it increased the difficulty of our staff being able to monitor that operation. They were operating, in essence, around the clock. There were trucks backed up out of the gate onto the highway. It was impossible for ADEM to really be able to adequately monitor the site.

\* \* \* \*

[Tr. 316] Q. Now, if you will, please tell the Court the size and type of leachate storage facilities they have at Emelle.

A. Emelle has a tank farm that is capable of storing five million gallons of leachate.

Q. Five million gallons?

A. Yes.

\* \* \* \*

[Tr. 334] Q. For each one of those facilities the post closure period is 30 years; isn't it?

A. That's correct.

Q. Now, where is that 30 years set forth?

A. In EPA and State regulations.

Q. In the EPA and State regulations?

A. That's right. Our regulations are identical.

Q. Do your regulations have to be identical? They don't; do they?

A. No. The EPA, the RCRA law says that states can be more stringent.

Q. So, if you wanted to extend the post closure care period beyond 30 years, you could change the State regulations to do it; couldn't you?

A. I guess that is a discussion. We have considered that and are evaluating the 11th Circuit's opinion to [Tr. 335] determine if we can do that.

\* \* \* \*

[Tr. 336] Q. And I assume if ADEM didn't like the way that corporate guarantee was written, since the permit he has got to certify that it is word for word identi-

cal with the regulations, you can change the regulations; is that right?

A. On the financial assurance part of the regulations, EPA is very cautious, and I would doubt that we could change it without stringent tests, because of the necessity to be equal; but, in theory, you could, yes.

Q. Okay. What you are saying is the financial assurance required not only in Alabama but everywhere in the United States has to be word for word identical?

A. That's correct.

Q. Under EPA regulations?

A. Yes.

\* \* \* \*

[Tr. 350] Q. So it would be fair to say that the statements in here where they have any criticisms of post closure liabilities would apply pretty much equally to any kind of facility that closes in place?

A. In theory, yes; it is saying there is that same concern.

\* \* \* \*

[Tr. 361] Q. So, I take it that if the United States of America, hypothetically, was a responsible party, that would relieve some of your concern about the state being ultimately stuck, if you will, if I can use the vernacular?

A. Again we're getting back on the area of where the federal government really is liable or would choose to be liable.

Q. I am asking you to assume, for sake of argument, they are absolutely, strictly, jointly and severally liable under 107A CERCLA.

A. You may make a theoretical assumption, then, yes.

\* \* \* \*

[Tr. 364] Q. Now, earlier you were talking generally about risk, and risk of the what ifs that occur or could occur, might occur, earthquakes, tornadoes, or hurricanes. The risks other than volume was the thing that you talked about Emelle, as I recall?

A. That's correct.

Q. It didn't really have anything to do with whether the waste was from in state or out of state?

A. That's correct.

Q. It really had to do with volume?

A. Quantity, yes.

Q. So you would agree that the risks don't depend on where the waste comes from, given equivalent quantities?

\* \* \* \*

[Tr. 365] Q. The risks don't depend on whether it is in state waste or out of state waste; your concern is the volume?

A. The chemical composition at the landfill would not be any different; but you would have the transportation risk we discussed also. And that is related to quantities; but you have the different routes coming in.

Q. Now, some of the routes coming in, speaking of transportation, some of the routes coming into Emelle only travel over Alabama highways just a few miles if they are coming from the west?

A. Yes.

Q. And Emelle is almost to Mississippi?

A. Almost in Mississippi, yes.

\* \* \* \*

[Tr. 366] Q. Now, let me ask you one thing, if you know it. I think you had talked about what you tried to calculate as the number of trucks that went into the Emelle facility in 1989, and I think you came up with a 40,000 figure?

A. In general, yes.

\* \* \* \*

[Tr. 369] Q. Okay. Now, speaking of transporters, you have said, in terms of hazardous waste transportation, that ADEM regulates hazardous waste transportation?

A. That's correct.

Q. And you give them permits if they meet certain requirements?

A. That's correct.

Q. And one of the requirements is they have to have adequate liability insurance to take care of things like this. This happened to be a chemical spill?

A. That's correct.

Q. That one you didn't regulate until it got spilled; is that right?

A. That's right.

Q. But the hazardous waste trucks you regulate while they [Tr. 370] are rolling?

A. That's correct.

Q. And you wouldn't give a permit to a hazardous waste transporter if it didn't have adequate liability coverage; would you?

A. We wouldn't give a permit unless it complied with the regulations which require that.

Q. The regulations require adequate liability coverage?

A. Correct.

\* \* \* \*

[Tr. 410] Q. Now, Ms. Robertson, you ended up, I think, by saying, [Tr. 411] if I caught this correctly, there are risks inherent to managing hazardous waste; is that correct?

A. Yes.

Q. So there would be risk to managing hazardous waste not only at the Emelle facility, not only at the Allied Signal incinerator, but all of the other 32 additional hazardous waste treatment, storage and disposal facilities; right?

A. Yes.

\* \* \* \*

### TESTIMONY OF RICHARD GROSHONG

\* \* \*

[Tr. 267] Q. Now, Dr. Groshong, do you presently teach at the University of Alabama as a full professor?

A. Right, I do.

Q. What is your area of concentration or teaching?

A. Structural geology, rock deformation.

Q. All right, sir. Is it correct that you and Dr. Rona J. Donahoe prepared a paper back in April of this year entitled Hazardous Waste Disposal in the Upper Crustatious Selma Group?

A. That is correct. That is actually a composite guidebook consisting of three individual papers.

\* \* \*

[Tr. 268] Q. Incidentally, what is the position of Dr. Donahoe at the University of Alabama?

A. She is an associate professor of geology.

Q. Now, is it correct that in this study that you have done, you have made some comments on the fractures and faults and joints out at Emelle?

A. Slight comment on that, rather specific comment on work that we did nearby at Port Epps, in Epps, Alabama.

Q. Is that Sumter County?

A. Right.

Q. What is significant about Port Epps?

A. It's an excellent exposure of the Selma chalk, which we were able to visit and do our work at.

Q. And would you tell us briefly how you may describe fractures and joints and faults?

A. Okay.

Q. In whatever order you think appropriate.

A. A fracture is used by many geologists and engineers as kind of a general term. Properly it is a brittle crack and can be a fault with displacement parallel [Tr. 269] to the surface, can be a joint with displacement perpendicular to the surface.

So, with the paper, we tear it—

Q. Hold that up so the Court can see that. Would you turn please and face the Court.

A. Okay. This qualifies as a fracture. Now, if it does nothing more than this (Indicating), then it would be known in the geological terminology as being a joint; and a joint might move a little bit open, it might move a fair amount open; so that would be a joint. And there are joints in the Selma chalk. The other thing that the fracture might do is move parallel to its face, in which case it becomes classified as a fault in the geological terminology. Faults may, as you can see with this one, produce gaps and holes along the trend of the fault when they move.

Q. Now, what you described, those fractures, faults and joints, were they present in the Selma chalk?

A. They are.

Q. And is that what you have done your paper on?

A. Right.

\* \* \*

[Tr. 274] Q. Now, I ask you to look at your paper beginning the next page, Roman Numeral 421, and tell us in layman's language, and if you could, just give us a quick summary of that.

A. Okay. Well, the subject was structures influencing the permeability of the Selma group in western Alabama. In the numerous exposures that we have worked on, including the one at Epps, we find that there are faults and joints fairly commonly in the Selma chalk. Both of those are known geologically to be commonly capable of transmitting water. So our question was, is there

[Tr. 275] any evidence that the fractures that we see in this area are capable of transmitting water. And we found considerable evidence that the faults do, at least some of the faults do, transmit water. We found less evidence that the joints transmit water; but the faults transmit water because they do have holes along them from place to place, and also some of them are fairly

complex zones of multiple faults, which when they move do exactly what this piece of paper does, which is they don't fit properly like that (Indicating), and consequently develop holes along the fault zone. We collected some of the fillings, because these faults are characterized by having calcite fillings. We collected some of the fillings, and some of them are completely filled and appear to be nonconductive; others there are holes that you can stick your pencil into, in these fillings, where it is simply an incomplete filling. The fillings are calcite that was deposited from saturated fluids, presumably from deep underground. The fillings also show evidence that they have been subsequently chemically etched, which means they have been attacked by unsaturated fluids which is characteristic of shallow ground water. So, that is one of the evidences that these faults are transmitting ground water today. Other evidence is that they are [Tr. 276] significantly stained by iron, and only the faults were stained. We didn't find evidence of that on the joints. Of course, the fairly out in the field evidence is that the water was leaking out of the faults in the outcrop and the plants were growing on the faults in the outcrop as opposed to no water leaking out of intact chalk, and no plants growing on the intact chalk in this area. So that is the basic evidence that we had.

Q. How deep do these faults and fractures extend into the Selma chalk, in your opinion?

A. As far as we know, they could go completely through the chalk. We really don't know. No one knows, as far as I am aware.

Q. Do you mean all the way down to the Eutaw aquifer?

A. Perfectly possible.

Q. Now, is the area around the faults and fractures more or less permeable than the chalk itself?

A. Well, I would judge that the fault zone itself would be more permeable than the chalk itself. It could be more permeable by many orders of magnitude.

Q. What do you mean by many orders of magnitude?

A. By factor of a thousand, factor of 10,000. It entirely depends upon how big the hole is and whether it has been completely filled or partially filled.

[Tr. 277] Q. Now, did you reach a conclusion in your paper, reach an opinion back earlier this year as to whether, in your opinion, the fractures, faults, rather, at the Emelle facility had been properly mapped?

A. We find no evidence that they have been mapped. There are certainly no maps that I have been able to see. So, I would have to say that, to my knowledge, they have not been properly mapped.

Q. At my request on Thursday of last week, Thursday and Friday, did you review the Golder & Associates reports which were identified and have been identified in this case, some 12, I believe, and the two Woodward Clyde reports which have been furnished us by the plaintiff which we, in turn, furnished you?

A. Yes, sir.

Q. Now, after having reviewed those reports, do they, in any way, affect that opinion you had reached back in April?

A. Well, they confirm it in part. We inferred from aerial photo studies that probably there were faults in the pits at Emelle. Also we had photographs taken by other people that showed the faults in the pits. The reports confirmed that.

Q. Were those the pictures of trench 16, I think, that were in the book?

[Tr. 278] A. That are in our book, right. So the report did confirm the presence of the faults, and the Woodward Clyde report, one of them, discussed doing permeability tests on three of the faults, and their permeability tests showed, as far as they were concerned, no difference in permeability on the faults than in the rock around it, which doesn't really alter my opinion, because that would be true on the faults we saw ourselves, depending upon where you measured the fault,

because the faults change their properties along the plain of the fault. So, to actually document that the fault doesn't leak anywhere, you have to see the whole fault and then you have to decide whether there are no holes along the fault or whether, in fact, there is maybe, let's say, on a 50 foot exposure of a fault you might find two significant holes six inches in length. So, I have no idea whether the worst part of the fault was tested or not.

Q. Would there be anything in the Golder & Associates or these other two Woodward Clyde reports that would indicate that had been done?

A. No. As far as I could tell, it was not done.

Q. What is your opinion, after having read these reports, the 12 or so Golder & Associates reports and the two Woodward Clyde reports?

[Tr. 279] A. My opinion would be they really have no idea whether the faults are potentially going to leak.

Q. Do you have an opinion as to whether the water is moving laterally in the Selma chalk?

A. It certainly was in the exposures that we looked at, otherwise we wouldn't be able to see evidence of the water moving out of the fault zones. I guess I really don't have an informed opinion about the waste site itself.

Q. Now, did anyone pay for the paper that you prepared, the time and effort that went into it?

A. No; this was scientific research, just part of the job.

Q. Originally who was to publish—

A. Originally this was to be published as a part of a meeting related guidebook series to be published by the State Geological Survey.

Q. Did the State Geological Survey, in fact, publish this?

A. Not this one, no.

Q. Was there any reason stated as to why not?

A. Nothing in writing. Informally I was told that this was too controversial, they didn't want to publish it.

Q. Who, in fact, did publish it, this paper?

A. The Alabama Geological Society, which is an organization [Tr. 280] of geologists.

Q. Of geologists here in Alabama?

A. Right.

Q. Approximately how many members?

A. Maybe a hundred and fifty.

Q. Are most geologists in Alabama members of that society?

A. Probably the vast majority.

Q. Now, in your opinion, is it possible for the fractures and faults to extend all the way down to the Eutaw aquifer?

A. It is very possible. And we really don't know why those faults are there. Every place we have seen very good exposures of the Selma chalk we tend to see the faults. So, as far as I know, we have seen a fair amount of it in different places.

Q. In your opinion, is it possible that the faults or fractures that could extend vertically down into the Eutaw aquifer, would they have increased permeability of several orders of magnitude?

A. It is certainly possible.

Q. What about laterally at the surface?

A. It would be the same.

\* \* \* \*

[Tr. 281] Q. Dr. Groshong, as I understand it, you did not do a study of the Emelle facility; is that correct?

A. Not within the facility. We did a photo study, an aerial photo, taken of the site.

Q. You did not do any studies on the ground or in the ground at the facility?

A. No.

\* \* \* \*

[Tr. 282] Q. You have never done any hydrogeological characterization of the Emelle facility; have you?

A. No.

Q. All right, sir. You have also not done geochemical studies of the Emelle facility; have you?

\* \* \* \*

[Tr. 283] Q. Have you ever—I assume as a geologist you have done permeability tests?

A. I haven't done the test, no.

Q. You actually have never done a permeability test of anything?

A. That's true.

Q. Okay. Well, I guess you didn't do any permeability tests of any of this Selma chalk then; did you?

A. Nothing.

\* \* \* \*

### TESTIMONY OF BILL BROCK

[Tr. 416] Q. Would you state your name, please?

A. My name is Bill Brock.

Q. What is your title?

A. I am the Director of the Alabama Emergency Management Agency.

Q. What is the function of the Alabama Emergency Management Agency?

A. My agency is one that controls, manages, monitors any emergency situation that might occur within the state of Alabama.

[Tr. 417] Q. Well, would your agency have a role to play, say, in the event of an accident on a highway?

A. Depending upon the severity and if it was an accident carrying some kind of hazardous material or chemical spills or volatile or explosive material.

Q. What about natural disasters?

A. Yes, sir, we are responsible for emergency recovery phase of any disaster.

Q. Mr. Brock, are you aware that Chemical Waste Management operates a facility at Emelle, Alabama?

A. Yes, sir.

Q. And that is located in Sumter County; is it not?

A. That's correct, yes, sir.

Q. Are you aware that ChemWaste has a contingency plan that has been introduced already as Defendant's Exhibit Number 55?

A. Yes, sir, I am.

Q. And the contingency plan identifies possible emergencies that might occur on site; is that correct?

A. That is correct, yes, sir.

Q. And just briefly, isn't it also correct that the contingency plan identifies both emergencies that are inherent to facilities operations, that is fires and accidents and spills, as well as natural disasters that might occur, such as tornadoes?

[Tr. 418] A. As I have read it, yes, sir.

Q. Now, would the Emergency Management Agency play a role in the event of an emergency of any kind at Emelle?

A. At Emelle or any other site if the emergency expands or continues to grow to the point it surpasses the ability of that community, that subdivision, to handle it themselves, at that point then we are there to dispatch any other state or federal resources that are necessary in the recovery or cleanup or any other problems that may be occurring.

Q. In fact, the contingency plan identifies your agency as the contact source; does it not?

A. That is correct, yes, sir.

Q. Are you familiar with the recent history of tornadoes and severe thunderstorms in the Sumter County area?

A. Yes, sir.

Q. And say for the last 12 months or so, can you tell the Court whether there have been any tornadoes in Sumter County?

A. According to our log book and the duty officers, we maintain a duty officer 24 hours a day, and direct contact by telephone and radio with the public safety people statewide in the region of the southeastern United States, and also direct lines with the National Weather Service, and any time a storm front approaches [Tr. 419] we are notified and we have our own radar system that we monitor these storms with as they develop and come in out of Mississippi. In the last 12 months in Sumter County we have recorded 10 severe thunderstorm watches in Sumter County.

Q. What is a thunderstorm watch?

A. A watch is a description issued or a category issued by the National Weather Service that said the cloud system or cold front moving in has the potential of developing severe thunderstorms, that you need to be on the watch, be prepared to make necessary emergency preparations.

Q. How does that contrast with a warning?

A. Well, in the stages as it progresses the watch occurs and then when the storm starts developing and the clouds start building in size and severity, at that point, or some point in between, they say a severe thunderstorm has formed. You see the intensity levels change on the radar screen and that determines at the point a new warning is issued, because you have seen a thunderstorm cell build. Usually when the thunderstorm warning exists, at that point the National Weather point will issue a tornado watch. When the severity of the storm builds to the point of level five or level six, the potential of a tornado is forming or microbursts [Tr. 420] that are now being identified as we have had in the last few weeks in Alabama. They can form out of a severe thunderstorm at any time without warning; so usually we will issue a tornado watch at that point. Then when the tornado watch is there, that immediately notifies us as well as the meteorologist to be on the watch to watch those thunderstorm cells as they travel across the state and to look for any further development. If we see that, then a tornado warning is then issued. A tornado warning can also be issued when there is a definite hook symbol on the radar screen or there has been a visual sighting of a tornado.

Q. Now, you have your log book there; do you not?

A. Yes, sir.

Q. How many severe thunderstorm warnings have been made for Sumter County in the last 12 months?

A. In the records that we maintain we had 10 thunderstorm watches, four of those turned into thunderstorm warnings. Of the four thunderstorm warnings we had eight tornado watches for Sumter County, with two tornado warnings, which means there were at least two tornadoes sighted. One was within a half a mile of the Emelle facility in Sumter County.

Q. When did that occur?

A. The sighting of the tornado that was within half a [Tr. 421] mile of the site, to my recollection, without going back through the records, would be in the second week of February.

Q. Of this year?

A. Of this year.

\* \* \* \*

[Tr. 428]

Q. Would you indicate to the Court from this exhibit, Number 60,— Would you tell the Court what accidents [Tr. 429] have occurred involving vehicles destined for Emelle since 1981?

A. Would you like for me to start at the top?

Q. Yes.

A. On 2/10/81 a truck carrying acid had run off I-20 spilling the material. EPA was not notified until 2/20, some 10 days later. On 3/27/81,—

MR. DeBRAY: Judge, the exhibit has been offered, and I assume it will be admitted into evidence. Is the witness going to read this entire exhibit into the record?

THE COURT: Has the exhibit been—

MR. SIMON: We can move on, Your Honor. We offer it in evidence.

THE COURT: All right, I will admit the exhibit over their objection.

Q. Mr. Brock, do you have an opinion, based on your experience, as to whether an increased number of trucks going to Emelle would increase the likelihood of accidents?

MR. DeBRAY: Objection. He hasn't laid the proper foundation that this witness can give an opinion of that nature.

THE COURT: Ask him if he can.

Q. Can you give an opinion on that, Mr. Brock?

[Tr. 430] A. Yes, sir, I feel I can.

Q. What is your opinion?

A. Any time you have an increase of traffic, whether it be trucks, cars, or what, in a concentrated area such as a rural area of Alabama where the roads were not designed for large volume truck traffic, you are bound to have some type of traffic buildup or backup of vehicles in those areas, because the roads are not designed to handle this volume of vehicles. If this is occurring at the time we have a tornado warning, or a tornado watch, we have got exact history recorded of what happened in Huntsville, Alabama on November 15 of last. It was at rush hour, the intersection started backing up with traffic when the tornado came through. The majority of the deaths that were recorded in Huntsville, Alabama from that tornado was because of that backup or volume of traffic on those highways. Had there not been that much volume, had there not been that many vehicles on that road, there would not have been as many deaths. So, at the same time those large volumes, and I understand some days it is in excess of a hundred trucks a day that are going into that particular facility, it has to create a volume or an impact on the roadways of that area.

\* \* \* \*

[Tr. 434] Q. Let me ask you this, based on your position as Director of the Emergency Management Agency, has the agency received any report of earthquakes?

A. Only in the last four to six months. I would say it would be in the last six months I have been following and monitoring the earthquake situation in the state of Alabama. In the last four months I have instructed my staff to start a map, start an indexing of all reported incidences of earth tremors or earthquakes within the boundaries of the state of Alabama. This was in preparation for a scientific prediction of what is proposed to happen on December 2nd or 3rd of this year. The scientific community is currently studying. It has been a lot of news reports about this particular event that is sup-

posed to happen in the New Madrid Fault area of New Madrid, Missouri. Alabama is in the risk zone. We have a risk potential all the way to an area just north of Montgomery. In that particular area it depends on the severity and scale of the earthquake that is supposed to happen at that time, I felt that it would be a prudent thing to do to start monitoring the activity, because I just felt we would [Tr. 435] have some news inquiries, media inquiries, about activity in the state of Alabama. So, not only in our duty log do we record these things but the reports we get from the central United States Earthquake Consortium, those reports are also recorded and one of those particular reports, Lamar County, I believe in May of this year, recorded an earthquake of a three scale on the Richter scale in Lamar County. We have other recorded incidents in northwest and west Alabama of various tremor activity.

Q. Is Emelle in the risk zone?

A. Yes, sir, it falls within the risk zone.

\* \* \* \*

[Tr. 437] Q. Now, Mr. Brock, the earthquake zone that you talked about, the risk zone that you said was throughout north and northwest Alabama, I believe; is that correct?

A. That's correct. That is from the New Madrid fault.

Q. So, facilities throughout that entire area would be [Tr. 438] at risk; would they not?

A. Yes, sir.

Q. Manufacturing facilities?

A. Yes, sir.

Q. Storage facilities?

A. Yes, sir.

Q. The chemical companies up there that store hazardous materials, they would be at risk; is that correct?

A. Yes, sir.

Q. You were asked a question about the contingency plan of Emelle. Have you ever read that?

A. Yes, sir.

Q. Do you know whether or not that is in accordance with ADEM regulations?

A. I am not familiar with ADEM. It is in accordance with SARA Title 3 program that we have to model the federal government. We have approved that particular plan with our people.

Q. So you had input in approving that plan; is that correct?

A. Yes, sir.

Q. You didn't call for that plan to make any kind of contingency, for example, for earthquakes; did you?

A. My people had the input in improving the plan. I, in turn, direct and manage my people; but the particular area of earthquake preparedness, no, I am not aware [Tr. 439] that anything was asked to be put into that.

Q. Now, the tornadoes that you talked about?

A. Yes, sir.

Q. Those tornadoes are not indigenous to Sumter County, are they? I mean, tornadoes can happen anywhere?

A. That's correct.

Q. And you heard testimony here today that there are 34 hazardous waste treatment facilities in the state of Alabama; have you not?

A. I don't know.

Q. You were in the Courtroom; were you not?

A. Not at that particular point of the testimony.

Q. Believe me when I tell you that is what she testified. And if that is what she testified to, tornadoes—those facilities would be subject to tornadoes just like the Emelle facility; isn't that correct?

A. That would be correct.

Q. When a tornado hits, it takes everything above ground; doesn't it?

A. Above; and if it happens to go over an open pool of water, there are records where it actually drained that pool of water and sucked it up like a vacuum cleaner.

Q. So, if there is waste buried underneath the ground, it's not necessarily subject to any kind of tornado?

[Tr. 440] A. I think that would be an accurate assumption.

\* \* \* \*

[Tr. 453] Q. So, if waste was enroute to the Emelle facility from the state of Michigan and had an accident, there was a spill or incident, that required response by your branch of government, then it wouldn't be treated any differently than if there were wastes that were originated from up in the Mobile area coming to the Emelle facility?

A. That is a correct assumption.

Q. Are the risks associated with the waste different dependent upon the point of origin? In other words, is there anymore risk associated with waste that originates in the state of Michigan as waste that originates in the city of Mobile?

A. The only risk that we would have a reason to question the level of risk would be the volume of it. If it was a pickup truck load from Mobile and three tanker loads from Michigan, then naturally the risk is going to be greater from the three tanker loads than it would be from the pickup truck load from Mobile.

Q. If there is a tanker load from the state of Texas and a tanker load from the city of Mobile, carrying the same substance to the Emelle facility?

A. Under that particular scenario the risk we assume, that we would determine, would be equal.

\* \* \* \*

#### TESTIMONY OF TOM JOINER

[Tr. 484] A. The one big question that has been kicked around with respect to this Selma chalk is does it have any water in it. You have heard that it doesn't have any water until it gets to 140 feet, which is the potentiometric surface of the Eutaw. This study, and the other work that had been done with shallow monitoring wells, tells you there is water in the Selma chalk, and there is water in the Selma chalk right up to very close to the land surface. And it tells you that the water in the Selma chalk does move. It will move from the high areas to the low areas. Another thing that was significant on this particular study was the fact that the day before they took their piezometer reading, the level of water in those wells they had drilled, they went and checked the level of the fluid in the trenches and these trenches have been placed on here, and so this depicts the situation where these trenches have filled with water.

[Tr. 485] Q. Which trenches?

A. All trenches shown on here, as depicted, have filled with water to the level of the water table. They have reached equilibrium with the water table. These arrows that you see here. These arrows that you see here are their interpretation of the way that water flows. You will note it indicates definite lateral and downward movement of the water. It is noting lateral and downward movement of water out of these trenches. And getting to the definition of leachate, that would be water that had come in contact with the material in the trenches. Then you would have to assume, on the basis of this diagram, that leachate has moved out of the trenches into the Selma chalk.

\* \* \* \*

[Tr. 492] Q. Now, I believe you also said that in your opinion the water, since it was at equilibrium with the water table, that the leachate or fluid from the trenches would be into the Selma chalk; is that correct?

A. The flow that comes through the trenches is shown moving out into the Selma chalk, that's correct.

Q. And you say it is shown moving out into the Selma chalk. Would you tell us what you are referring to?

A. Here is the arrow showing the flow direction. These are flow vectors, as they call them, nonscaling. That doesn't mean anything quantitative; but it is just the direction you would have flow movement.

Q. Now, if left as is, if left undisturbed, what would be the direction of the movement of the leachate from those trenches?

A. Well, if you were to just leave this alone and let it flow, follow the flow vectors here, you can see that the water is going to keep moving seeking its lowest level. And by these flow vectors you can get in here and see that at some point you will have some upward flow into the stream. Now, you have also got a factor here that after you get down to about 138 [Tr. 493] or 140 feet you start getting some artesian pressure from the Eutaw.

Q. That is not depicted here; but you say that is the—what would you call that point at 140 feet approximately?

A. I would call that potentiometric surface of the Eutaw formula.

Q. So you are dealing here with two different things; surface water on one hand and ground water in the Eutaw on the other hand, and in the subcategory of ground water, or a different category being ground water in the upper portions of the—below the water table but within 10 to 12 feet of the surface up in the Demopolis chalk?

A. You have this water in the water table conditions, yes; and you have the flow regimen that they have established for this. Then also there is the Eutaw potentiometric surface that has to be considered in the overall scheme of things. But, with the flow coming down it will continue coming downgrade, downhill, if you will, until it discharges at the land surface into a drainage area or stream.

Q. Into what?

A. Into drainage area or stream.

Q. You mentioned drainage area. Looking at the first [Tr. 494] overlay on Exhibit 64, would you point out in the vicinity of these trenches is there a particular drainage area nearby?

A. You do have a drainage course coming in just north of trench 7, that extends off slightly northwestward, and you have another one here running going north—northwest, just north of trench 7.

Q. Is there a downward gradient coming from those closed trenches depicted on Exhibit 67 down into this drainage area?

A. I do not have this drainage area related elevation-wise to this section, so I can't speak for that directly on that. The thing I can tell you is that the movement of water is downward in that direction, and, you know, it is indicated on these sections. And it is also shown on this potentiometric map. It shows the level of that surface water is progressing lower and lower as it comes down.

THE COURT: Is this the kind of thing that they look at when they determine whether they are going to make this interim permit permanent or not? Does anybody know that? Go ahead.

Q. All right, sir, this, of course, is stated to be—this was August 1990, and I believe you testified to that; but is it, then—what is the first wet water [Tr. 495] all year round creek that runs in the area, or stream that runs in this general area?

A. I guess Bodiker Creek would be the nearest one that I know of.

Q. This is Bodiker Creek running in a roughly northwardly direction?

A. Generally northeasterly trend up there; and it goes up there a ways and then runs into the Natsuga River, I believe, and turns into the Tombigbee River.

Q. Do you know approximately how far the Tombigbee River would be from this point?

A. No, sir, I haven't measured that.

Q. Then is the Tombigbee River the boundary of Sumter County to the east?

A. It may be. I'm not sure. Do you want me to check?

Q. Yes, sir. Let's look at this map. Turn it over. Looking now at the Alabama Geological Survey.

A. The Tombigbee River would be the easternmost boundary of Sumter County, apparently all the way from the northern part of the county to the southern boundary.

Q. Okay. Let me ask you, is there anything further you want to say about that?

A. I was going to say as the crow flies it looks like it would be about 10 miles over to the Tombigbee River from the Emelle site.

[Tr. 496] Q. That is a straight line?

A. Yes, sir.

Q. Then, can you give any estimate, in your opinion, or do you have an opinion as to a travel time from the trenches to the drainage area? Do you have any opinion as to how far the leachate has moved out into the Selma chalk or Demopolis chalk?

A. No, sir.

Q. What are variables that would impact on travel time in this surface area of this leachate that has moved out into the Selma chalk from the closed trenches as depicted on the Golder reports?

A. You are referring to travel time or migration?

Q. Migration. Excuse me.

A. I think the variables would be the material through which the water had to move, and the condition of the material. If it is just solid unfractured chalk it would have one rate of movement; if it was just solid jointed chalk it would probably be very close to that same rate. And if one of the brittle faults, as described by Dr. Groshong, existed you could have along that another rate.

Q. Would that be a faster rate?

A. It would be a faster rate if the fault existed as described in some of these.

\* \* \* \*

[Tr. 510] Q. Let's talk about risks to Alabama from the operation of the Emelle facility and the dangers, whatever, from a hydrogeologic engineering point of view.

A. Well, I summarized for you, and I think I gave to Mr. Wells in deposition, the major concern that we, we being my staff and I saw, was the fact that this facility is in Alabama, it is going to be here forever, and the long term liability of the facility was a major concern. The facility will have to be monitored. It will have to have regulatory surveillance. It will have to be maintained. It will have to be secured. And if there are any upsets of any kind that require abandonment or remediation, that will have to be done.

Q. Now, let's talk about monitoring. What do you mean with respect to monitoring?

A. Well, the monitoring that I am talking about right there would be the maintenance of good monitoring wells suitably placed, and hoping that you don't have any surprises with an unknown brittle fault as described by Dr. Groshong, bypassing that. That is an uncertainty that rests out there. But, at any rate, as they have done to this point, and I am sure they will in the future, you will have to make your best stab at installing and keeping a good monitoring well system [Tr. 511] there, which can be checked and provide a measure of quality assurance in the future.

Q. With that good monitoring well installation, would that include efforts to try to intersect every brittle fault from the various trenches?

A. I think, you know, as trenches are excavated they can see what they have in the trench area, and decisions for placement of monitoring wells can and are being made on a basis of that, is my understanding. That is something that is just going to have to continue. Now, after operations are ceased, there will be no new ones; so you have to hope in the process of getting all of this done that you are able to get any of these fractures or faults that could be problems pinpointed.

Q. Do you know whether all of the fractures at this time have been mapped?

A. I would be very surprised if all of the fractures and faults have been mapped. I think they've probably documented all that they have encountered in the trenches that have been excavated.

Q. In your opinion, would it be wise, in attempting to make sure that the monitoring wells are placed everywhere, to attempt to map all of the faults, brittle faults, or whatever?

A. I doubt if they can map all of them. There is a limit [Tr. 512] to what you can do on the land surface to look underneath. That will remain an uncertainty.

Q. No matter how many monitoring wells are put in, from a practical point of view?

A. From a practical point of view, yes, sir.

\* \* \* \*

[Tr. 513] A. The findings of the Golder report are significant, because they demonstrate that you can have outward migration of this leachate toward the surface water in the state. And from the standpoint that it is a potential threat to the state of Alabama, I am concerned. I would think that from the standpoint of—well, I will just speak for myself. That is all you asked me for?

Q. Yes, sir. You mentioned secure. What do you mean by that?

A. I mentioned secure the facility from the standpoint of not letting people in there to have vehicle races, to disturb the surface, the security of the facility, both from the standpoint of the facility keeping it, [Tr. 514] keeping the integrity of the facility good and intact. And also from a safety standpoint of somebody getting in there and not knowing what they are dealing with and maybe create a problem for themselves and others. As far as the maintenance, not to leave that completely, maintenance of the grounds, you know. I think we have a lot of that grassed over and maintained and other

structures on it; but maintenance of the grounds against future erosion. You know, it is one thing to think 30 years and something else to think a hundred years; but when you think about it's going to be there as long as this state is here, then that puts another perspective on it. So, that could be a significant factor.

Q. You mentioned—was there some other? You had abatement and remediation; but was there anything else before that with respect to maintenance, security, and monitoring?

A. Regulatory surveillance. And somebody, Sue Robertson's people, or somebody in ADEM, is going to have the regulatory responsibility for this facility as long as it is there. They are going to have to insure that things that need to be done get done. So, that is an ongoing factor.

\* \* \* \*

[Tr. 515] Q. From a geological scientific point of view or hydrogeological point of view, what, if anything,—would there be anything involved with possible abatement?

A. If a brittle fault, such as described by Dr. Grossong, existed and was capable of transmitting liquids undetected, the liquids could move through that fault and be missed by your monitoring wells. Then that could, you know, without having any specific information on how fast the liquid can flow through those brittle faults, it could be a few years or it could be many years; but still quite a bit faster than liquid would move through the chalk itself. Conceivably you could have outward migration through one of those type features that would create a problem that would have to be remedied, have to either abate it or go ahead and remedy [Tr. 516] it completely.

Q. From a geological scientific point of view what, if anything, would there be from a remediation factor?

A. Well, that was the kind of thing that I was talking about with abatement. If you can stop it and it is something you can tie in with your regular monitoring and

regulatory surveillance, that is okay. If it has created enough of a problem that you have to go in and remove some of it and remedy that particular problem, then that is the remediation I was talking about.

\* \* \*

[Tr. 518] Q. Would it be significant, in your opinion, as to whether or not there had been a previous earthquake in the Sumter County area?

A. I think it would be significant in that having once happened there you feel reasonably sure it could happen there again.

\* \* \*

[Tr. 519] Q. Is the existence of a major water system, such as the Tombigbee, a factor to be considered in measuring the risk from national disasters, such as an earthquake, or from contamination of ground water, excuse me, surface water?

A. It is very difficult to project or hypothesize natural disasters, particularly as you would deal with something as unknown as, you know, the magnitude, whether it is going to hit or not, whether the magnitude is there or not, to try to relate it to something in Bodiker Creek or Tombigbee River, I think, you know, if you wanted to come from a consequence of an earthquake to this region of Sumter County, the one thing, and probably it would not take a major earthquake to do this, just one where you could feel the trembling of the ground, it could have an impact on cracking the material that seals some of the faults and open those again for the [Tr. 520] movement of water through them. You know, I suppose you could create all kinds of nightmarish situations for yourself with respect to what a major one would be; but certainly I am not in a position to do that. But if they did—if you did have the effect that I was talking about, then that could open avenues for the movement of water that do not exist today. And that could have a fairly strong bearing on future liability.

Q. In your opinion, is there any likelihood of increased knowledge, scientific, geologic point of view, that as we learn more about hazardous waste and its geological and hydrological effect from speaking on hazardous waste as landfilled in a facility such as Emelle, do you anticipate future increases in liability or risk or danger to the state?

A. Well, I think there's no question but what there will be additional knowledge gained about handling it, storing it, the hazards associated with it, and this kind of thing. And as that knowledge is developed and as technology evolves to respond to it, it probably will result in some changes in the regulations. And as changes in regulations occur, it could mean more monitoring in some instances for parameters not presently being monitored. It could increase the amount and [Tr. 521] level of effort that would have to be done in the future as this technology evolves.

Q. And the future long range cost of whoever it is during that time doing the monitoring?

A. Whoever is doing the monitoring and the maintenance, keeping the security.

Q. Of course, involved in the monitoring and removal of leachate would be the handling of that leachate after it was removed; would that not be correct?

A. That is correct.

\* \* \*

[Tr. 527] A. My opinion is that as far as the state of Alabama is concerned, the more waste that we have in the state the higher our future liability is with respect to the facility.

Q. You are speaking of the hazardous waste landfill facility at Emelle?

A. Yes, sir.

Q. Would that be speaking of more additional waste brought into the hazardous waste landfill facility at Emelle?

A. The more waste we have and the more area that is prepared to receive the waste, the larger the facility be-

comes, the more monitoring wells you need, the more maintenance will be required, you increase the area that you have to keep secure, and you have increased amount of material that is down there to possibly create a problem.

\* \* \*

[Tr. 546] Q. You agree, don't you, Mr. Joiner, that because of the Selma chalk the Emelle facility is the best location for a hazardous waste management facility like this in the state of Alabama; don't you?

A. I'm not sure how many turns you have in that question. I will not say the Emelle facility is the best site in the state of Alabama, because I think we have other areas within the chalk belt that could accommodate a similar facility just as well.

Q. Well, that—

MR. NETTLES: Had you completed your answer?

MR. WELLS: I'm sorry. I didn't mean to interrupt.

Q. But essentially the Selma chalk area?

[Tr. 547] A. The Selma chalk area for this type facility, in my opinion, is the best that we have in the state of Alabama.

\* \* \*

[Tr. 555] Q. Your opinion is based on the fact that water will move in the Selma chalk?

A. That's correct.

Q. Albeit it at a very, very, very slow rate?

MR. NETTLES: How many verys?

MR. WELLS: I think I had three; but I might not have given enough.

Q. Is that correct?

A. It moves at a very slow rate, yes, sir.

Q. I believe you said that is one of the reasons this is a good site for a facility such as this?

A. Yes, sir.

Q. Now, in terms of anything moving through the chalk, it is not going to depend on whatever it is that is

moving through the chalk, whether it came from in Alabama or out of state; is it?

A. You will need to give me that one in another form, maybe, or something.

Q. It is not going to make any difference in terms of movement of liquid through the chalk whether the [Tr. 556] material in the trench is from in state or out of state; is it?

\* \* \*

**PLAINTIFF'S EXHIBIT 61****BERNARD L. WEBB****I. General**

Born, November 27, 1924; married; two children;  
4841 Mill Brook Drive, Dunwoody, Georgia 30338.

**II. Degrees and Designations**

M.S. Business Administration—University of Richmond, 1964

B.S. Business Administration—University of Richmond, 1949

Fellow, Casualty Actuarial Society—1964

C.P.C.U.—1956

**III. Teaching Experience**

Georgia State University, 1967-1989

Member, National CPCU Examination Panel,  
1978—Present

C.P.C.U. Preparation Classes for Norfolk, Virginia  
Association of Insurance Agents and State Farm  
Insurance Companies, 1956-1962; Georgia Chapter,  
Society of CPCU, 1968-Present

Member, American Academy of Actuaries, 1966

University of Richmond, 1957-1962

Member, National CPCU Grading Panel, 1961-1979  
Wisconsin State University, 1963-64

Director, Basic Insurance School, National Association  
of Professional Insurance Agents, 1980,  
1981 and 1982

Insurance Institute for Asia and the Pacific, 1982

**IV. Honors and Awards**

Robert E. Early Visiting Scholar at the American  
Institute for Property and Liability Underwriters, 1977 and 1980

Alumni Distinguished Professor, College of Business  
Administration, Georgia State University, 1978

Ben F. Hadley Award, Griffith Foundation for Insurance  
Education, 1976

**V. Professional Organizations**

American Academy of Actuaries

American Risk and Insurance Association

Casualty Actuarial Society

International Actuarial Association

Society for Insurance Research

Society of Chartered Property and Casualty Underwriters (Past President of the Georgia, Virginia and Northern Wisconsin Chapters; Past Editor of *CPCU Annals* (now *CPCU Journal*))

Southern Risk and Insurance Association

**VI. Insurance Experience**

Consultant to the Multistate Antitrust Task Force,  
1988 to present.

Consultant to the Florida Academic Task Force for  
the Review of the Insurance and Tort Liability  
Systems, 1987-88.

Director, Physicians Insurance Company of Michigan,  
1985 to present.

Consultant to the United Nations Commission on  
Trade and Development, 1984

Consultant to the U.S. Department of Justice,  
1977-1980

Consultant to the Subcommittee on Antitrust and  
Monopoly of the Committee on the Judiciary of  
the United States Senate, 1968, 1969

Actuarial Specialist, Hardware Mutual Casualty  
Company, 1964-1967

Marketing Specialist (Research), Hardware Mu-  
tual Casualty Company, 1962-1964

Executive Secretary, Insurance Advisory Commit-  
tee of the City of Richmond, Virginia, 1955-1962

Sales Correspondent, Hardware Mutual Casualty  
Company, 1953-1955

#### **PLAINTIFF'S EXHIBIT 62**

[State Seal]

STATE OF ALABAMA  
Governor's Office  
Montgomery 36130

For Immediate Release

August 27, 1987

Contact: Terry Abbott  
Stacey Rimer  
261-7150

MONTGOMERY: Gov. Guy Hunt Thursday said he will develop legislation to curtail the dumping of hazardous and solid wastes in Alabama while the Alabama Department of Environmental Management pursues new regulations to address such health problems.

"I wish to make it absolutely clear that we will take any and all action available to us to keep out-of-state waste out of Alabama. We will handle our own problem but we don't want anybody else's problems," Gov. Hunt said.

Gov. Hunt said he will push safeguards to ensure that solid waste generated out-of-state destined for an Alabama disposal location is comparable to that generated in-state and does not contain hazardous or infectious waste which are excluded from disposal in state sites.

He also called for "increased involvement of county and municipal governing bodies in assuming more local responsibility for approving the sighting of sanitary landfills" as specified in the Alabama solid waste disposal act in section 22-27-5 of the Alabama code.

Gov. Hunt also said he wants existing facilities which intend to begin accepting much larger volumes of solid waste to secure a permit modification that would be as closely scrutinized as are applications for new facilities.

"I feel there must be more stringent siting requirements for commercial hazardous waste landfills and incineration facilities. Secondly, we must consider a cap or limit on the amount of waste received by commercial facilities," Gov. Hunt said.

"Although I have publicly proclaimed that 'Alabama is Open for Business,' I would like to clarify that statement by saying that this welcome is not extended to those in the business of burying solid, hazardous, or infectious wastes in our soil . . . or to those that would pose a threat to the quality of life for the citizens of this state," Gov. Hunt said.

"A major crisis facing this state, and this nation, is that of waste management. Whereas the volume of both hazardous and solid waste increases daily, the disposal alternatives are diminishing," Gov. Hunt said.

Gov. Hunt cited the recently internationally publicized incident involving the barge-load of garbage which left the Long Island community of Islip on March 22.

"After a five month 'odyssey' during which the waste was rejected by five states and three foreign countries, a solution was finally found, to return it to New York State, burn it, and bury the residue. In other words, the problem was returned to its point of origin for a solution," Gov. Hunt said.

The governor questioned if such situations would be more common in the future.

"My conclusion is that they will and that Alabama has the potential to become a prime candidate for disposal based on available land area, favorable geographical conditions, and, in some instances, waste disposal fees which provide an economic incentive to 'bring it to Alabama,'" Gov. Hunt said.

Gov. Hunt reviewed several recent events regarding solid waste disposal which reinforce his hypothesis.

Gov. Hunt said within the last month, state and environmental officials have had six inquiries from both existing sites, as well as proposed new facilities regarding the acceptance of large quantities of solid waste generated by out-of-state communities.

"This situation is alarming in the light of 41% of the state's sanitary landfills being unable to accommodate of Alabama communities within the next five years because they will be filled to capacity," Gov. Hunt said.

"One of those inquiring stated that as whereas disposal fees in the New York state area approximated \$100 per ton, by using the Tennessee-Tombigbee Waterway as a conduit, waste could be barged into Alabama and disposed of for less than \$20 per ton. It is not very difficult I believe for anyone to understand the economics involved," Gov. Hunt said.

The governor highlighted the hazardous waste management and Alabama's role in assuming a major share of the nation's responsibility for disposal.

"The chemical waste management site at Emelle currently manages approximately 400,000 tons of hazardous waste per year, about 85% of which is generated outside the state," Gov. Hunt said. "I am convinced that other companies are showing an interest in siting similar commercial hazardous waste facilities in the state primarily due to favorable geographical conditions. I predict that these factors which make Alabama so attractive as a hazardous waste disposal site will draw the solid waste disposal industry to us like a magnet."

Gov. Hunt noted a major hurdle in siting hazardous waste facilities in this state was recently ruled unconstitutional in federal court. He said the ruling involved the requirement of the Minus Act that such a facility receive approval of the Alabama Legislature.

"A significant aspect of this ruling, however, was that it clearly defined such authority as being within the pur-

view of legislative functions. I will quote directly from the conclusions of the federal court order: 'The court emphasizes that the constitution does not foreclose legislative restrictions on hazardous waste facilities. Such restrictions appear to this court to be essential for the protection of the health and safety of Alabama citizens. Storage of toxic waste is properly the subject of intense public concern. This court only holds that the Legislature must announce some reasonable standard which will guide its deliberations or the deliberations of an appropriate agency such as the Alabama Department of Environmental Management in determining which applicants are approved, and these standards must bear at least some rational relationship to a legitimate state purpose,'" Gov. Hunt said.

The governor said the creation of such standards will be a major priority of his administration to ensure the health and safety of Alabamians: standards that will allow Alabama to place a priority on solving this state's waste disposal problems before assuming the responsibility for other states.

In addition, the governor said there should be full disclosure and publication of relevant details on permit modifications to existing sites and permits for new facilities to include names of corporate officials, projected volume, and locations where the solid waste is generated and maximizing effective public input through public comment periods on all permit modifications for existing facilities and applications for new sites.

And he noted an increased in disposal fees for commercial hazardous waste management facilities with a distinction in charges for the disposal of waste generated out-of-state versus that originating in-state should be approved by the Legislature.

"Critical components in both of these issues will be efforts to promote waste minimization, reduction, and

recycling and increased public information and educational programs," Gov. Hunt said.

"We think that our proposals are much the better.

Hazardous waste: "We need to do two things. We need to stop the increase in hazardous waste and lower it, as we tried to do with our cap bill that did not come out of House Judiciary (committee).

"If people are serious about tax reform next year, then (the impact of the higher fees on the budget is) something that can be looked at there. In the meantime, we've got to do something to stop the flow of hazardous waste into this state, to force other states to get their incinerators and do their job that they ought to do and that we've got a right to expect them to do. I'd be tickled to death to get both that increase and the cap bill" signed into law, the governor said.

"What his (Harper's) proposal is is that we allow 400 pounds for every man, woman and child in the state to come in."

Mail order sales: "If someone orders a hundred dollars worth of trees . . . if California is going to charge sales tax, then Alabama can charge sales tax. We think that that's much better than messing with the income tax at this particular point in time. These (companies outside Alabama) are competing with in-state firms that pay sales tax and they ought to have to pay sales tax."

## PLAINTIFF'S EXHIBIT 77

[State Seal]

STATE OF ALABAMA  
Governor's Office  
Montgomery 36130

For Immediate Release

January 29, 1990

Contact: Terry Abbott  
Stacey Rimer  
**242-7150**

**GOV. HUNT WANTS CAP ON HAZARDOUS WASTE,  
HIGHER FEES, SAYS 'NO' TO INCOME TAX IN-  
CREASE**

**MONTGOMERY:** Alabama needs higher fees for dumping hazardous waste and limits on dumping to protect the state's environment, but taxpayers don't need higher income taxes, Gov. Guy Hunt said Monday.

Responding to reporters' questions about a legislator's proposal to shelve his plan to raise money for the state's General Fund while curtailing hazardous waste dumping, Gov. Hunt said he believes his plan is "much the better."

A proposal by state Rep. Taylor Harper of Grand Bay would help balance the state's budget by increasing many Alabamians' income tax payments to the state while making only a small adjustment in the fee for dumping hazardous waste in Alabama.

"We think that our proposals are much the better," Gov. Hunt said of his plan, which would increase the fee for dumping hazardous waste by \$85 a ton on out-of-state shipments and \$50 a ton on waste produced in Alabama.

Gov. Hunt also is proposing a bill to "cap" the dumping of hazardous waste in Alabama at 650,000 tons this

year and reduce the dumping annually until the dumping reaches a maximum 350,000 tons in 1993.

"We need to do two things. We need to stop the increase in hazardous waste and lower it, as we tried to do with our cap bill that did not come out of House Judiciary (committee) last year," Gov. Hunt said.

Gov. Hunt proposes using the increased fees on hazardous waste dumping to partially fund law enforcement needs, state social service programs, the prison system and pay raises for state employees for a couple of years while lawmakers work on reforms of the tax system.

"If people are serious about tax reform next year, then (the impact of the higher fees on the budget is) something that can be looked at there," Gov. Hunt said. "In the meantime, we've got to do something to stop the flow of hazardous waste into this state, to force other states to get their incinerators and do their job that they ought to do and that we've got a right to expect them to do. I'd be tickled to death to get both that increase and the cap bill" signed into law, the governor said.

The governor said it is wrong to think that the increase will make Alabama too dependent on hazardous waste fees. He said Alabama has no real competition for the hazardous waste and that the state should raise its fees and impose limits on dumping to force other states to use waste incinerators and other technology to take care of their own problems.

Gov. Hunt also opposes Mr. Harper's hazardous waste bill because it would allow 950,000 tons of hazardous waste to be dumped in the state each year.

"What his proposal is is that we allow 400 pounds for every man, woman and child in the state to come in," the governor said of Mr. Harper's plan.

Gov. Hunt said rather than Mr. Harper's plan to increase Alabamians' income tax payments to the state, he

would rather see the state extend the sales tax on mail order sales as 20 other states have done.

"If someone orders a hundred dollars worth of trees . . . if California is going to charge sales tax, then Alabama can charge sales tax," Gov. Hunt said. "We think that that's much better than messing with the income tax at this particular point in time."

Gov. Hunt is proposing the mail order sales tax as an alternative to Mr. Harper's reported plan to cut income tax deductions, therefore increasing the income tax burden of thousands of Alabamians.

"These (companies outside Alabama) are competing with in-state firms that pay sales tax and they ought to have to pay sales tax," Gov. Hunt said of the mail order tax plan.

#### **PLAINTIFF'S EXHIBIT 80**

##### **STATE OF ALABAMA**

Governor's Office  
Montgomery 36130

[State Seal]

For Immediate Release

April 17, 1990 -

Contact: Terry Abbott  
Stacey Rimer  
242-7150

#### **GOV. HUNT INCREASES HAZARDOUS WASTE DUMPING FEE**

**MONTGOMERY:** Gov. Guy Hunt, declaring "there are no more environmental bargains to be found here," signed legislation Tuesday sharply increasing the fees for dumping hazardous waste in Alabama, a law he called "one of the most important pieces of environmental protection legislation in our state's history."

Gov. Hunt, in a State House ceremony, signed into law a bill raising the dumping fees to \$40 a ton for hazardous waste generated inside Alabama and \$112 a ton for waste shipped in from outside the state.

"Sunday is Earth Day, a day set aside to remember the importance of protecting our environment. In Alabama we are going to start celebrating early by signing into law one of the most important pieces of environmental protection legislation in our state's history," Gov. Hunt said at the news conference.

The governor said the new law eventually will force a reduction in the amount of hazardous waste dumped in Alabama by making it less profitable for waste producers to ship to Alabama.

"For many years Alabama has been the hazardous waste dumping ground of the nation. In Sumter County is the largest toxic waste dump in the world, and last year almost 800,000 tons of hazardous chemicals were dumped there," Gov. Hunt said.

"Although the dump at Emelle is probably one of the safest such facilities in the country, many believe it is a ticking toxic time bomb. In 20 or 30 or 50 or 100 years it may leak and pose a much greater threat to the safety of generations to come," the governor said.

"Today we will take an important step toward scratching Alabama's name off that list of favorite places to dump hazardous waste," he said. "On the day I took office just over three years ago, toxic waste producers in other states could drive their problems to Alabama and dump them for only \$6 a ton. But today, Alabama is taking down that sale sign. With this law it's going to cost \$112 a ton to bring hazardous waste into Alabama from other states. Let the message go out. There are no more environmental bargains to be found here."

Gov. Hunt said that "in time, this sharp increase in dumping fees will force other states to start doing a better job of taking care of their waste problems. They have the technology available to them now, but they have never had the incentive to use it because Alabama has always welcomed their dumping with open arms."

"When this bill was being debated, some in the hazardous waste business warned that this would dramatically reduce dumping in Alabama. Good! That's what we want to do," Gov. Hunt said. "And if it is reduced, we're going to make sure it stays that way. An important provision in this bill will cap the amount of hazardous waste that can be dumped in Alabama at whatever amount is brought to the state over the next 12 months. In other words, if the new law cuts dumping from 800,000

tons to 100,000 tons, then that's going to be the limit on dumping in Alabama."

"This bill will, in time, force a reduction in the amount of hazardous waste produced by those firms, and it will require states to start using incinerators and other methods for disposal that are safer than landfilling," Gov. Hunt said.

Gov. Hunt said in the meantime the fees from the new law will help to balance the state's General Fund budget, "and give the Legislature time to do what it says that it wants to do: reform Alabama's tax system."

The governor said: "This day, as Earth Day approaches and Tax Day has passed for another year, will be remembered as the day that the environment and the taxpayers got a break."

The new law marks the third time in three years that Gov. Hunt has increased the fees for dumping hazardous waste in Alabama. Gov. Hunt also signed legislation banning shipments from states that do not accept hazardous waste, and entered into a compact with four other southern states to better manage the flow of hazardous waste.

**DEFENDANTS' EXHIBIT 14****GAO**

United States General Accounting Office  
Report to the Congress

June 1990

**HAZARDOUS WASTE**

Funding of Postclosure  
Liabilities Remains  
Uncertain

[GAO Seal]

GAO/RCED-90-64

**GAO**

United States  
General Accounting Office  
Washington, D.C. 20548

Resources, Community, and  
Economic Development Division

**B-237563**  
June 1, 1990

To the President of the Senate and the  
Speaker of the House of Representatives

The Superfund Amendments and Reauthorization Act of 1986 directed that we study options for a program to manage liabilities associated with hazardous waste disposal facilities after closure which complements the policies set forth in the Hazardous and Solid Waste Amendments of 1984 and assures the protection of human health and the environment. This report presents the results of our review by discussing

- the likelihood that permitted hazardous waste disposal facilities will leak after closure.
- the magnitude of liabilities that may be incurred.
- the adequacy of current postclosure funding assurance requirements, and
- the feasibility of other mechanisms that could provide greater postclosure funding assurances.

\* \* \* \*

/s/ **J. Dexter Peach**  
**J. DEXTER PEACH**  
Assistant Comptroller General

## EXECUTIVE SUMMARY

### Purpose

Although past land disposal of hazardous waste has resulted in major environmental contamination and serious health effects, land disposal of these wastes continues. About 13 million metric tons of hazardous waste is land disposed each year. Better disposal practices—including treatment of wastes to reduce toxicity—and containment methods are now required at operating hazardous waste disposal facilities; nevertheless, the possibility exists that hazardous substances will eventually leak from these facilities and costly cleanup actions would be required to protect the public health and environment.

Concerned about the funding of long-term liabilities—costs, damages, or other expenses—that may be associated with permitted hazardous waste facilities once they have closed, the Congress required GAO to conduct a study of options for managing postclosure liabilities. GAO focused its study on the extent and magnitude to which postclosure liabilities are expected to occur at permitted facilities when closed and the need for, and viability of, options for funding these liabilities.

### Background

The Resource Conservation and Recovery Act (RCRA) regulates the management and disposal of hazardous waste. As implemented by the Environmental Protection Agency (EPA), the act requires owners/operators of disposal facilities to obtain an operating permit in order to continue waste disposal operations. To obtain a permit, facilities must meet certain standards intended to prevent and/or detect leakage to the environment. About 200 land disposal facilities have, or are expected to obtain, operating permits.

After a disposal facility ceases operation, EPA requires that closure activities be performed, including the installation of covers over the disposed waste. EPA further requires the owner/operator to perform maintenance and monitoring activities at the facility for a 30-year postclosure period. Owners/operators must provide financial assurance that funds will be available to conduct mandatory postclosure activities.

Certain liabilities, such as costs for cleanup and third-party damages, may result during postclosure if facilities leak and contaminate the groundwater. A postclosure liability trust fund to manage these costs was established under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). However, concerned that, as structured, the postclosure fund may not provide sufficient resources, the Congress suspended the transfer of any liability to the fund.

### Results in Brief

The long-term effectiveness of current land disposal practices in controlling the migration of hazardous waste is not known, but EPA and others believe it is likely that some of the permitted hazardous waste disposal facilities will release hazardous substances into the environment at some period after they close. However, the timing and magnitude of any resulting postclosure liabilities—such as the costs of corrective action and off-site damages—are uncertain.

Although EPA is aware of the potential for releases, it has not developed a strategy for addressing long-term postclosure concerns. EPA has given this issue a low priority in the RCRA program because of limited resources and the lack of historical data on the magnitude and extent of the potential problem.

EPA does require funding assurances for mandatory postclosure care and known corrective action costs,

but it does not require funding assurances for potential but unknown postclosure liabilities. Although there are several options for funding postclosure liabilities, few of these are currently viable in large part because the risk associated with closed hazardous waste facilities is difficult to quantify. As data on long-term risks become available, the Congress will be in a better position to decide on the need for additional postclosure funding mechanisms.

### Principal Findings

#### Extent of Liabilities Uncertain

EPA requires facilities obtaining operating permits to design and construct disposal units with waste migration prevention measures, such as liners and covers, intended to mitigate releases into the environment. Little experience-based data exist, however, on the long-term performance of these technology requirements in preventing waste migration. Although at least one company producing liner and cover material estimates that the material will last hundreds of years, EPA and others believe that permanent containment of wastes is not possible and that leakage will occur at some time after the 30-year postclosure period. (See ch. 2.)

When leakage occurs, liabilities could be incurred for extended maintenance and monitoring, compliance monitoring, corrective action, and third-party damages. However, the extent of any liabilities will be contingent on factors that cannot currently be assessed, such as the rate and timing of leakages, the magnitude of contamination by hazardous substances, and the exposure to such contamination.

EPA officials have identified activities, such as extended postclosure care and long-term research, that may be required to identify and reduce the potential for leakage after facilities close. However, EPA has

not developed a strategy to comprehensively obtain data on the effectiveness of current disposal requirements and examine long-term postclosure issues because (1) experience with current disposal requirements is limited and (2) available resources have been needed in other RCRA program efforts that address more immediate environmental concerns. Such a strategy needs to be developed and implemented in a timely manner in order to assure that actions needed to reduce postclosure concerns are promptly taken.

#### Funding Mechanisms Questionable

Owners/operators are liable for any postclosure costs that may occur. However, few funding assurances exist for postclosure liabilities. EPA only requires funding assurances for maintenance and monitoring costs for 30 years after closure and corrective action costs once a problem is identified. No financial assurances exist for potential but unknown corrective actions, off-site damages, or other liabilities that may occur after the established postclosure period. EPA could require funding assurances for certain potential liabilities, but it does not believe it would be appropriate to require a facility to provide funding assurances for liabilities that may not occur. (See ch. 3.)

Options such as insurance and risk pooling could be pursued to better assure funding of postclosure liabilities; however, their availability is limited because the risks involved with postclosure are viewed as high and very difficult to assess and quantify. Federally administered programs—such as a modified postclosure trust fund or federal insurance—could also be established; however, the appropriate structure for any such program cannot be assessed because of the lack of data on the extent and magnitude of postclosure liabilities. Such information can only

be obtained when EPA implements a strategic plan for developing data and measures to assess postclosure risks. As EPA collects and analyzes the data, the need for and structure of a postclosure funding mechanism can be better determined.

It is important that EPA deal with the issue of long-term postclosure liability in an orderly, reasonable, and timely manner. GAO anticipates that EPA can develop a strategic plan to address the postclosure liability issue in time for the debate on the reauthorization of CERCLA which is expected in 1991. Moreover, EPA should be prepared to take interim measures—such as extending the postclosure care period—to provide greater protection to the public health and the environment until more definitive data are developed.

#### Recommendation

GAO recommends that the Administrator, EPA, develop and implement a strategy to address the long-term effectiveness of current hazardous waste disposal requirements so that decisions can be made about postclosure liability funding mechanisms. Such a strategy should outline the activities EPA needs to undertake and/or complete to assess postclosure risks, evaluate actions such as extended postclosure care to reduce risks, and assess available alternatives for funding postclosure liabilities. The strategy should also identify required EPA resources and establish time frames for completing such activities. Further, GAO recommends that the Administrator periodically report to the Congress the agency's progress in obtaining the necessary data on the effectiveness of current disposal requirements and as information becomes available, be prepared to take interim measures to provide greater public protection until more definitive data are developed.

\* \* \* \*

## Chapter 1

### INTRODUCTION

As evidenced by the events at Love Canal, Times Beach, and thousands of other sites contaminated by hazardous wastes, land disposal of these wastes presents a significant threat to human health and the environment. Hazardous waste disposal can contaminate the land as well as ground and surface waters. Once contaminated, cleanup of a hazardous waste site can cost millions, take many years to complete, and in some cases it may not be possible to remove all contamination. Moreover, many contaminants are toxic, may lead to cancer, or have other adverse human health effects.

Despite the acknowledged problems of hazardous waste, land disposal of some of these wastes continues. About 275 million metric tons of hazardous waste are managed annually. Although a national hazardous waste management program has been established to minimize the disposal and environmental impacts of hazardous waste, about 13 million metric tons are still land-disposed each year.

#### Current Hazardous Waste Disposal Program

Through the enactment of the Resource Conservation and Recovery Act (RCRA), the Congress imposed strict controls over hazardous waste to protect human health and the environment. Subtitle C of RCRA establishes a "cradle-to-grave" system for managing hazardous waste from the time it is generated until its ultimate disposal. This system regulates the generation, transportation, treatment, storage, and disposal of hazardous wastes.

\* \* \* \*

The hazardous waste facilities of greatest concern are land disposal facilities—facilities that place the

wastes in the ground for permanent burial. RCRA established strong controls over hazardous waste disposal facilities to prevent the recurrence of past leakage problems. The act requires any owner/operator of a hazardous waste disposal facility to obtain a permit to operate. Further, land disposal facilities must meet certain standards for construction, operation, and closing of the facility in order to obtain the permit and remain in compliance with the permit conditions.

\* \* \* \*

#### Requirements for Postclosure

As part of the regulation of hazardous waste under RCRA, EPA established closure and postclosure requirements for owners/operators of disposal facilities. Closure is the period when wastes are no longer accepted at a facility, and during which the owner/operator must properly apply final covers to or cap the landfill, decontaminate or remove all contaminated equipment and structures, and certify that the facility has been properly closed. These activities are required to ensure that facilities are closed in a manner that (1) minimizes the need for additional care and (2) controls, minimizes, or eliminates the potential escape of hazardous substances to the environment.

To assure that hazardous waste land disposal facilities do not pose environmental or public health hazards after closure, such facilities must enter into a postclosure care period. During this period, owners/operators conduct maintenance and monitoring activities to ensure the integrity of the facility. As required by EPA, postclosure care consists of at least

- groundwater monitoring and reporting,
- maintenance and monitoring of the waste containment systems, and

- security around the facility when access may pose a hazard to human health.

EPA requires that these postclosure activities be conducted for a 30-year period following the closure certification. All disposal facilities must develop a plan outlining the postclosure activities and have the plan approved by EPA. Further, owners/operators must prepare postclosure cost estimates and demonstrate the financial ability to pay these costs before they can obtain a permit.

Despite the protective measures now required at facilities and the requirements for postclosure care and monitoring, longstanding concerns exist over the liabilities that could occur after closure and the ability of owners/operators to pay for such liabilities. The Congress addressed this issue with the enactment of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The act, which established the Superfund program, also established a Postclosure Liability Trust Fund (PCLTF) to assume the liabilities at permitted hazardous waste disposal facilities after closure. Liability would be transferred to the fund within 5 years after closure and after demonstration of no likelihood of migration or release. After transfer of liability, the fund, generated from a tax on disposed hazardous waste, would pay for damages, such as groundwater contamination and necessary cleanup actions, resulting from a release. The fund would also pay for monitoring and maintenance beyond the 30-year postclosure period. The balance in the fund was limited to \$200 million, although additional taxes could be collected if the balance dropped below that amount.

However, concerns about PCLTF and the unlimited liability that could be transferred to the government were raised in the deliberations on reauthorizing CERCLA in 1985. In particular, the Congress and EPA were concerned that the fund would not have sufficient resources to pay the liabilities. Subsequently, under Section 201 of the Superfund Amendments and Reauthorization Act (SARA), the Congress suspended the transfer of liability to the PCLTF. Further, the Congress repealed the tax and the trust fund and authorized the refund of the amounts collected to the owners/operators who had paid into the fund. CERCLA will be up for reauthorization in 1991.

#### Objectives, Scope, and Methodology

With the repeal of the Postclosure Liability Trust Fund, the Congress required us to study options for a program to manage postclosure liabilities. SARA Section 201 established the general requirements that a postclosure program should assure (1) incentives are created and maintained for the safe management and disposal of hazardous wastes, (2) the public will have reasonable confidence that hazardous wastes will be managed and disposed of safely and resources will be available to address any problems that may arise and will cover the costs of long-term care, and (3) owners/operators of hazardous waste disposal facilities will be able to manage their potential future liabilities and attract investment capital necessary to build, operate, and close such facilities in a manner that assures protection of human health and the environment. Another provision of section 201 was that separate assessments be made for different classes of treatment, storage, and disposal facilities that have been or probably will be issued a permit. Such assessments were to address the current and future financial capabilities of owners/operators, the current and future costs associated with facilities,

and the availability of mechanisms to assure these costs can be financed.

In conducting our study, we found that several of these requirements could not be fully addressed. As discussed later in this report, data necessary to assess future costs and financial capabilities are not available. Consequently, to best address the overall issue of postclosure liability and provide the Congress now with a meaningful perspective on liability questions, we focused our work on addressing the following questions.

- What is the likelihood that permitted hazardous waste disposal facilities will leak in the postclosure period and/or beyond?
- What is the magnitude of liabilities that may be incurred after these facilities close?
- Do current mechanisms provide adequate funding assurances for these liabilities?
- How feasible are other mechanisms that could be used to provide greater assurance that funds will be available to address postclosure liabilities?

\* \* \* \*

In addressing these issues, we relied primarily on information from EPA's Office of Solid Waste (OSW), which is responsible for managing the RCRA program, and contacted other government agencies such as the Departments of Commerce, Treasury, and the Interior and the Federal Emergency Management Agency (FEMA) and the Nuclear Regulatory Commission (NRC) concerning various aspects of our review. In addition, we gathered opinions and data on the postclosure liability issue from two environmental groups and the commercial hazardous waste

management and treatment industries' associations. We also spoke with owners/operators of hazardous waste facilities, including one who both generates and disposes of hazardous waste and others who only treat and/or dispose of hazardous waste.

\* \* \* \*

## Chapter 2

### EXTENT OF POSTCLOSURE LIABILITIES UNKNOWN

EPA requires permitted facilities to meet certain requirements intended to prevent the leakage of hazardous substances into the environment. The requirements for liners, leachate collection systems, covers, and postclosure maintenance are believed capable of preventing leakage in the short term. However, for the long term—beyond 30 years—there are questions about the effectiveness of EPA's current requirements and concerns that leakage may occur.

Leakage that does occur after closure could result in significant liabilities such as corrective action costs and off-site damage claims. However, because of a lack of experience-based information, insufficient data exist on the extent and timing of potential leakage as well as the actions required to correct such leakage. Consequently, the magnitude of postclosure liabilities that could be incurred simply cannot be measured at this time.

EPA is concerned about the effectiveness of its standards for the long-term prevention of waste migration and the potential for postclosure liabilities. Both GAO and EPA's Science Advisory Board have recommended the development of a strategy—describing activities and time frames for their completion—to address such concerns. However, because postclosure at currently operating hazardous waste disposal facilities is not viewed as a current environmental problem, EPA has made this issue a lower priority in the RCRA program and has not developed the necessary strategy.

#### Current Requirements May Not Prevent Leakage After Postclosure

The land disposal of hazardous waste presents the possibility that hazardous substances may migrate

from the disposal facility and pose a risk to human health and the environment. To reduce this risk before the wastes are placed in the ground, hazardous waste must meet specified treatment standards to make it less toxic and mobile. HSWA prohibits the disposal of untreated hazardous wastes beyond specified dates and requires EPA to establish treatment standards after which waste treated in accordance with the standards could be land disposed. Treatment standards have been established for most hazardous wastes and standards for all remaining wastes are scheduled for issuance in May 1990.

Nevertheless, although some wastes degrade or can be made less hazardous through treatment, some substances remain hazardous forever. Consequently, in order to reduce the potential for leakage of these substances from permitted disposal facilities after they close, all such facilities must meet a number of construction standards to prevent and/or reduce the migration of hazardous wastes. These standards require, according to EPA guidance, that all owners/operators must do the following:

- Place double liners under any new landfill unit or any replacement or expansion of an existing unit.<sup>1</sup> Draft EPA guidance for double liners directs that the top liner be constructed of a flexible synthetic material, such as high-density polyethylene, and the bottom liner be constructed of either compacted low-permeability soil or a combination of a synthetic material and compacted low-permeability soil.
- Install leachate collection systems over the top liner and between the two liners. Leachate collection systems consist of a drainage layer to collect liquids generated in the disposal unit and a mechanism such as a pump to remove them.

- Cover the disposal units at closure. EPA's minimum technology guidance recommends that covers be of a multilayer design that includes a synthetic material and compacted soil.

\* \* \* \*

#### Long-Term Effectiveness of Waste Containment Measures Unknown

Under the current requirements, hazardous waste disposal units are expected to be effective in preventing leakage of hazardous constituents into the environment through the 30-year postclosure period. EPA's design and operating requirements for land disposal units specify that liners be constructed of materials to prevent the migration of any hazardous constituent through the liner during a unit's active life and postclosure period. The chief of OSW's Disposal Technology Section said that although little data are available on the actual use of liners in hazardous waste applications, EPA is confident that the current technology will be effective in preventing waste migration through the 30-year postclosure period. He said that properly closed units, with the required maintenance and leachate removal, will gradually "dewater" and dry out during the early years of postclosure and substantially reduce the likelihood of leakage during the 30-year postclosure period.

However, for the longer term—beyond the 30-year postclosure period—the effectiveness of the current technology requirements in preventing leakage is questionable. As stated in EPA's March 1986 proposed rule to assist in implementing the statutory provisions of HSWA

"EPA's position was, and still is, that absolute prevention of migration forever, or for the long term, is beyond the current technical state of the art. Thus,

at some time, some migration through the liner will probably occur."

\* \* \* \*

University researchers we talked with also said that problems may exist with the long-term effectiveness of current waste containment technology. One researcher said that there is little doubt that current hazardous waste facilities will leak. He said that present research shows that these systems will fail at some point, particularly after postclosure care ends, and that he views today's disposal of hazardous waste as merely a storage mechanism for hazardous waste that may have to be removed eventually. Another university researcher told us that the technology used today is the best available but that it is simply unknown if it will keep wastes in place.

#### Magnitude of Postclosure Liabilities Not Determinable

Postclosure liabilities are for the most part directly related to the leakages that may occur before and after a facility closes. Only one postclosure liability—maintenance and monitoring—is required in all situations and can be estimated. Other postclosure liabilities that may be incurred—compliance monitoring, corrective action, third-party damages, and natural resource damages—cannot be determined because of the unknown extent and timing of potential leakages and, in some cases, a lack of available data.

\* \* \* \*

#### Natural Resource Damages

Leakage from hazardous waste facilities could also result in damages to natural resources. As defined by CERCLA, natural resources are land, fish, wildlife, biota, air, water, groundwater, and other such resources belonging to or otherwise controlled by the

United States, any state or local government, or any foreign government.

\* \* \* \*

#### EPA Does Not Have a Strategy for Addressing Long-Term Postclosure Concerns

\* \* \* \*

The need for strategic planning in the area of hazardous waste disposal has also been raised by EPA's Science Advisory Board, a public advisory group that provides advice to EPA. In an October 1987 report on EPA's land disposal research program, the Board determined that it is difficult to predict that improved land disposal will be protective of human health and the environment for the long-term future. The report concluded that there is a need to evaluate and understand the long-term performance of what are now considered environmentally sound land disposal practices to ensure that these practices are environmentally sound for many decades. The report further concluded that there is an absence of a waste management strategy—detailing projects, timetables, and funding—necessary to develop the scientific and technical knowledge for developing land disposal guidance and regulations.

According to EPA officials, a comprehensive strategy for addressing long-term postclosure concerns at permitted hazardous waste facilities has not been developed. The officials stated that no strategy exists in large part because postclosure concerns at operating facilities currently have a low priority relative to other aspects of the RCRA program. They pointed out that EPA is conducting several activities that have statutorily mandated deadlines, such as the permitting of incinerators and the issuance of hazardous waste treatment standards and that these activities have been given high priority by EPA. One official added that the remaining EPA resources are directed

at issues that provide the most environmental benefit and that postclosure concerns at operating facilities is not a current environmental problem.

\* \* \*

#### No Financial Assurance Requirements for Unknown Liabilities

Postclosure financial assurance is currently required by EPA only for 30-year maintenance and monitoring as well as identified corrective action costs. Financial assurances are not required, however, for potential but unknown postclosure liabilities such as on-site cleanup or off-site damages. According to the Director, Permits and State Programs Division, EPA only requires owners operators to set aside funds for known contingencies: EPA does not believe it would be appropriate to require funds be set aside for unknown contingencies. Consequently, although EPA does not want situations to occur in the future where funds are not available to cover liabilities, it does not require large amounts of funds be set aside for liabilities that may not occur. The director added that such additional financial responsibility requirements could cause facilities to close, which would have serious negative effects such as reducing hazardous-waste disposal capacity and increasing illegal dumping.

Nevertheless, OSW officials stated that there is no assurance that funds would be available for unknown liabilities that may occur after permitted facilities close. They said that no one can predict what the future financial situation of any owner operator will be in the long-term with any certainty, and if an owner operator were to become bankrupt or otherwise go out of business, there is little likelihood that funding would be available for unanticipated postclosure costs.

\* \* \*

EPA has the authority to require additional financial assurances for certain unknown liabilities. Section 3004(a) of RCRA authorizes EPA to promulgate financial requirements for corrective action as it deems necessary or desirable. According to EPA, this authority is not limited to known releases. However, although EPA has issued a proposed corrective action rule in October 1986 that would require facilities with known releases to provide corrective action funding assurances, at that time EPA stated that it will not pursue such financial assurances for unknown releases until more analysis on the issue is completed.

\* \* \*

#### Private Sector Options

Private sector options for funding postclosure liabilities include private insurance, coinsurance, reinsurance, and voluntary risk pooling. Because of the unknown liabilities and perceived risk associated with hazardous waste disposal facilities after they close, these postclosure funding mechanisms are currently not viable options. Private insurance, coinsurance, and reinsurance are currently unavailable for postclosure liability coverage. Voluntary risk pools to cover postclosure liabilities have proved to be unsuccessful and are generally believed inappropriate for the hazardous waste disposal industry.

Private insurance has been unavailable for closed hazardous waste facilities for many years.

\* \* \*

A representative of the American Insurance Association stated that the postclosure insurance market does not exist, and they did not foresee that this market would open up anytime in the near future. According to the representative, the unavailability of

private hazardous waste insurance is primarily due to the following factors.

- The inability to measure or quantify the liability exposure at hazardous waste facilities along with a perception by the insurance industry that liabilities are certain to occur after these facilities close.
- An unwillingness by the industry to guarantee coverage on a perpetual, noncancelable basis to cover the entire 30-year postclosure period.
- The financial liability of the insurance industry in the pollution arena, where the conduct of the policyholder is no longer relevant and insurers would be ultimately liable for cleanup costs.

EPA has also determined that private insurance for postclosure is not available. In its October 1986 proposed rule for corrective action, EPA indicated that it was aware of only one company that had offered postclosure insurance and that this company stopped offering such insurance as of 1986.

\* \* \* \*

Neither coinsurance nor reinsurance is a viable option for assuring postclosure liability funding. As stated in the 1982 Treasury study, other private sector insurance arrangements such as coinsurance and reinsurance encounter many of the same shortcomings as private insurance, and consequently these options are not feasible in the foreseeable future. The senior economist responsible for the study told us that the feasibility of both coinsurance and reinsurance is dependent upon the existence of a robust private insurance market to cover these liabilities. As previously discussed, this market does not exist.

As discussed in our October 1987 report, the availability of reinsurance for hazardous waste facilities

has been limited since 1984, when foreign reinsurers began to leave the reinsurance market. A representative of the American Insurance Association stated that the association does not expect a resurgence in the reinsurance market for pollution liabilities.

#### Voluntary Risk Pooling

A risk pool is a group of riskbearers who spread and finance losses among themselves when private insurance is not available or prohibitively expensive.

\* \* \* \*

As discussed in the 1982 Treasury report, risk pooling is not a viable option for postclosure liability funding. Because postclosure liability is uncertain and potentially unlimited, Treasury determined that underwriting the risk of postclosure is no more acceptable to mutual associations than to individual insurance companies.

Representatives of hazardous waste disposal firms and NSWMA also pointed out that risk pooling was not a practical option for postclosure liabilities.

\* \* \* \*

However, although postclosure liabilities at hazardous waste facilities are difficult to estimate and private insurance is generally not available, federal insurance officials do not believe that it is an area for federal insurance coverage. Officials from FEMA's Federal Insurance Administration (FIA) said that federal insurance may not be appropriate for postclosure liabilities at hazardous waste disposal facilities. The FIA officials cited a number of concerns with establishing a viable postclosure liability insurance program, including the following.

- The lack of actuarial experience with postclosure liability costs. The officials said that with flood insurance, for example, risks can be quantified

based on historical data. However, the lack of experience-based data on postclosure liabilities makes it difficult to quantify the risks, costs, and coverage.

- Coverage of bodily injury claims. The federal insurance programs FIA administers have been limited to property damage only, and it is more difficult to quantify the risks associated with bodily injury and potentially more expensive.
- Certainty of risk. The possibility exists that even if facilities are built to current standards leakage will occur.
- The need for perpetual insurance coverage. In other areas insurance has a time limit, but postclosure coverage would be forever.

FIA's Deputy Administrator added that federal insurance is usually provided as a mechanism to influence behaviors and to achieve certain objectives while at the same time providing insurance coverage. For example, to obtain flood insurance, buildings must be built to certain standards which reduce the likelihood of flood damage. However, hazardous waste facilities already have to meet high standards for construction and maintenance, and therefore it appears that insurance is not needed to change the behaviors of facility owners/operators.

\* \* \* \*

EPA, however, does not believe that a modified postclosure trust fund would be appropriate federal policy. According to the Director, Permits and State Programs Division, a federal trust fund runs counter to the objectives of HSWA, which establishes the federal policy of discouraging the land disposal of hazardous waste. He said that a trust fund would serve as an incentive to land disposal of these wastes and could result in increase disposal capacity, which is currently not needed nor is it desired by EPA.

#### DEFENDANTS' EXHIBIT 40

November 1987

EPA-700/8-87-036

*Hazardous Waste Ground-Water  
Task Force*

*Evaluation of  
Chemical Waste Management, Inc.  
Emelle, Alabama*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
[EPA Seal]

ADEM

ALABAMA  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

[State Seal]

## INTRODUCTION

Concerns have recently been raised about whether commercial hazardous waste treatment, storage and disposal facilities (TSDFs) are complying with the ground-water monitoring requirements promulgated under the Resource Conservation and Recovery Act (RCRA). In question is the ability of existing or proposed ground-water monitoring systems to detect contaminant releases from waste management units. To evaluate these systems and determine the current compliance status, the Administrator of the Environmental Protection Agency (EPA) established a Hazardous Waste Ground-Water Task Force (Task Force). The Task Force comprises personnel from the EPA Office of Solid Waste and Emergency Response (OSWER), National Enforcement Investigations Center (NEIC), Regional Offices and State regulatory agencies. The Task Force is conducting in-depth on-site investigations of commercial TSDF's with the following objectives:

- Determine compliance with interim status ground-water monitoring requirements of 40 CFR Part 265 as promulgated under RCRA or the State equivalent (where the State has received RCRA authorization).
- Evaluate the ground-water monitoring program described in the facility's RCRA Part B permit application for compliance with 40 CFR Part 270.14(c).
- Determine if the ground water at the facility contains hazardous waste constituents.
- Provide information to assist the Agency in determining if the TSDF meets EPA ground-water monitoring requirements for waste management facilities receiving waste from response actions conducted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, Public Law 91-510).

To address these objectives, each Task Force investigation will determine if:

- The facility has developed and is following an adequate ground-water sampling and analysis plan;
- Designated RCRA and/or State required monitoring wells are properly located and constructed;
- Required analyses have been conducted on samples from the designated RCRA monitoring wells; and
- The ground-water quality assessment program outline (or plan, as appropriate) is adequate.

During September 15-25, 1986, a Task Force team conducted an evaluation at the Chemical Waste Management Incorporated (CWM) facility (EPA I.D. No. ALD000622464) at Emelle, Alabama (Figure 1). The inspection was coordinated by US-EPA Region IV Environmental Services Division (ESD) and consisted of personnel from ESD as well as US-EPA Headquarters, the US-EPA Region IV Residuals Management Branch, the Alabama Department of Environmental Management (ADEM), and GCA Corporation, who was the sampling contractor for this evaluation. In general the inspection involved review of state, federal, and facility records, facility inspection, laboratory evaluation and ground-water and landfill leachate sampling and analyses.

## BACKGROUND

Based primarily on geological criteria, a group of investors, known as Resource Industries of Alabama (RIA) acquired a tract of land which would become the Chemical Waste Management, Inc. facility at Emelle, Alabama. Under the authority of the Alabama Solid Waste Disposal Act No. 771, Regular Session, 1969, the Director of the Division of Solid Waste and Vector Control (Environmental Health Administration) issued a permit to RIA for construction and operation of a hazardous waste dis-

posal facility on May 4, 1977. Permitted waste types were solids and liquids categorized as potentially hazardous or toxic, except radioactive wastes and normal domestic and commercial waste. After meeting the conditions of the permit, RIA was given final approval for operation of a landfill on August 24, 1977. Immediately thereafter, the site began receiving waste.

Effective February 23, 1978, the RIA site was repermitted as Waste Management of Alabama, a subsidiary of Waste Management, Inc. They then filed a formal application with US-EPA dated March 10, 1978, for a landfill disposal permit for polychlorinated biphenyls (PCBs). This application was approved and accordingly issued by US-EPA on June 28, 1978, and modified in October, 1979 to allow disposal of liquid PCBs.

Hazardous waste permit responsibilities reverted to US-EPA on November 19, 1980 when federal regulations under the Resource Conservation and Recovery Act of 1976 became effective. On November 14, 1980, Chemical Waste Management Inc. obtained Interim Status under RCRA by filing a complete Part A application form prior to November 19, 1980.

US-EPA Region IV requested the Emelle facility's Part B application on February 8, 1983. In response, Chemical Waste Management made their original submission on September 9, 1983, and final revisions were accomplished in August 1986. The application was deemed complete in July, 1986, and at the time of the Task Force evaluation, a draft permit was on public notice.

\* \* \* \*

\* \* \* \*

#### GROUND WATER MONITORING UNDER 40 CFR PART 264

Upon issuance of their Federal RCRA permit, CWM will no longer be required to conduct monitoring of the Eutaw Formation as they have been under interim status. The State permit, however, will require CWM to continue to monitor the Eutaw. CWM submitted a waiver request in their Part B demonstrating that there is virtually no potential for migration of hazardous wastes or hazardous waste constituents to the Eutaw Formation (uppermost aquifer) within the active life and 30 year closure and post-closure period. The transit time through the Selma chalk was estimated by CWM to be 10,000 years. Independent EPA estimates of transit time using conservative estimates for equation variable were 330 years and 3,000 years for estimates using Darcy's Equation and a 2-D solute transport model, respectively. The very conservative 330-year estimate is considerably longer than the end of the post-closure period.

CWM's Federal RCRA permit will require that the consent agreement monitoring wells be monitored in lieu of the Eutaw wells to determine if there is migration of hazardous waste constituents and confirm the rate of migration should it be detected. Under the permit, these wells will be monitored semi-annually and will be evaluated for contamination using specific, objective criteria.

\* \* \* \*

It is difficult to draw any firm conclusions about possible shallow saturated chalk contamination using data from the Task Force evaluation. Of all the data reported from analyses of samples collected at the Consent Agreement and PCB chalk wells, the data for selected metals (arsenic, cobalt, nickel and selenium) and purgeable organic compounds are the most useful. TOC and TOX were the priority conventional parameters and analyses was obtained for these parameters from 11 of 13 and 9 of 13

wells, respectively. These data, however, do not appear to be useful indicators for this evaluation, since the samples from the background well, Well BG-02, were the only samples in which TOC and TOX were detected. It should be stated that this well appears to be located properly with respect to its function as a background or control well, and no explanation can be offered at this time for these apparently anomalous values.

The selected metals data does not indicate a clear pattern with regard to fracture-screened or deep-screened wells. Of the five wells adjacent to trenches in which these metals were detected, two are deep wells, two are fracture wells and one is a PCB well. The PCB wells were generally sited with respect to observed fractures and were completed at depths approximately 25 feet below trench bottoms. If the PCB well in question, M-58, were indeed a fracture well equivalent, then the data might indicate a trend towards higher metals concentrations and greater number of metal compounds occurring in fracture wells.

Of the six purgeable organic compounds detectable in samples collected from Consent Agreement wells, four, two each in wells SM-5 and SM-9, were detected in fracture wells. If the reasoning in the previous paragraph is followed, the compound detected in the sample from well M-56 could also be considered to be from a fracture well sample, indicating that possibly five of six occurrences of purgeable organic compounds were from fracture wells.

It would be unusual, however, if these fractures (e.g. Well SM-5 and SM-9 fractures) are indeed active conduits, that so few organic compounds were detected at the low levels measured (all less than 15 ug/l). The leachate in these trenches is a virtual soup of inorganic and organic compounds. One would expect, given the low levels of detection utilized in these analyses, that more than two purgeable organic compounds would be detected and that extractable organic compounds would have been detected as well.

The Task Force recommends that the following tasks be completed to evaluate the significance and probability of the fractures as conduits for leachate migration.

1. Conduct a trace element geochemical study of the Selma Chalk in the vicinity of the Emelle facility. Samples should be collected from on-site and off-site locations with utmost regard for obtaining pristine samples. The study should include, at a minimum, analysis for the trace metals arsenic, chromium, cobalt, nickel, and selenium. These analyses should look at both total and leachable (e.g. EP Toxicity procedure) concentrations. It is critical that the occurrence and mobility of these metals in the chalk be understood if decisions regarding contamination are to be made on the concentrations of arsenic, chromium and nickel in ground water collected from the Consent Agreement wells. This study should be performed by either EPA or ADEM.
2. Sampling the purgeable organic compounds in the vicinity of active trenches, particularly downwind should be conducted with the highest regard for field quality control and quality assurance. Field blanks should be prepared for purgeable organic analyses at each station where odors and wind blown dust are present during sampling to help evaluate the low level concentrations of organic compounds such as reported for Task Force samples. This task should be performed jointly by CWM and either EPA or ADEM during several regularly scheduled sampling events at CWM. Ideally, samples should be split at the "hot wells" sampled during the Task Force evaluations and any other wells at which purgeable organic compounds have been recently detected or which are in active areas.

These conclusions are speculative and are based on observations made during the Task Force Evaluation. While they are by no means conclusive, they do indicate that some fractures may be conduits for leachate migration from certain trenches.

\* \* \*

**DEFENDANTS' EXHIBIT 41****REPORT TO CONGRESS****DISPOSAL OF HAZARDOUS WASTES**

*This publication (SW-115) was prepared by the OFFICE OF SOLID WASTE MANAGEMENT PROGRAMS as required by Section 212 of The Solid Waste Disposal Act as amended and was delivered June 30, 1973, to the President and the Congress*

U.S. ENVIRONMENTAL PROTECTION AGENCY

1974

\* \* \* \*

## Appendix F

### SUMMARY OF THE HAZARDOUS WASTE NATIONAL DISPOSAL SITE CONCEPT

In the course of investigating the NDS concept for hazardous wastes as mandated by Section 212 of the Solid Waste Disposal Act (P.L. 89-272, amended by P.L. 91-512), important and relevant information was developed. Appendixes B and D, respectively, provide a list of hazardous wastes subject to treatment at such sites and summaries of current methods of treatment and disposal. This appendix summarizes the findings related to site selection, methods and processes that are likely to be used at a typical site, and costs for developing and maintaining such sites. An earlier study contains the detailed analyses performed and the rationale for this information.<sup>1</sup>

#### SITING OF HAZARDOUS WASTE TREATMENT AND DISPOSAL FACILITIES

The general approach to the site selection process was to first regionalize the conterminous United States into 41 multicounty regions (spheres of influence for major industrial waste production areas, which are closely related to hazardous waste production areas, served as the basis for regional delineation):

- (1) Seattle, Tacoma, Everett, and Bellingham, Washington
- (2) Portland, Oregon; Vancouver and Longview, Washington
- (3) San Francisco Bay Area, California
- (4) Ventura, Los Angeles, and Long Beach, California
- (5) San Diego, California

- (6) Phoenix, Arizona
- (7) Salt Lake and Ogden, Utah
- (8) Idaho Falls and Pocatello, Idaho
- (9) Denver, Colorado
- (10) Santa Fe and Albuquerque, New Mexico
- (11) El Paso, Texas
- (12) Fort Worth, Dallas, and Waco, Texas
- (13) Austin, San Antonio, and Corpus Christi, Texas
- (14) Houston, Beaumont, Port Arthur, Texas City, and Galveston, Texas
- (15) Oklahoma City, Tulsa, and Bartlesville, Oklahoma
- (16) Wichita, Topeka, and Kansas City, Kansas
- (17) Omaha and Lincoln, Nebraska; Des Moines, Iowa
- (18) Minneapolis, St. Paul, and Duluth, Minnesota
- (19) Cedar Rapids, Michigan; Burlington and Dubuque, Iowa; Peoria, Illinois
- (20) St. Louis, Missouri; Springfield, Illinois
- (21) Memphis, Tennessee
- (22) Shreveport, Baton Rouge, and New Orleans, Louisiana; Jackson, Mississippi
- (23) Mobile and Montgomery, Alabama; Tallahassee, Florida; Biloxi and Gulfport, Mississippi; Columbus, Georgia
- (24) Huntsville and Birmingham, Alabama; Atlanta and Macon, Georgia; Chattanooga and Nashville, Tennessee
- (25) Louisville, Frankfort, and Lexington, Kentucky; Evansville, Indiana
- (26) Albany, Troy, and Schenectady, New York

- (27) Indianapolis, Indiana; Cincinnati and Dayton, Ohio
- (28) Chicago and Kankakee, Illinois; Gary, South Bend, Hammond, and Fort Wayne, Indiana
- (29) Midland, Saginaw, Grand Rapids, Detroit, Dearborn, and Flint, Michigan; Toledo, Ohio
- (30) Columbus, Cleveland, Youngstown, and Akron, Ohio
- (31) Pittsburgh, Johnstown, and Erie, Pennsylvania
- (32) Charleston, West Virginia; Portsmouth and Norfolk, Virginia
- (33) Charleston, South Carolina; Savannah and Augusta, Georgia
- (34) Winston-Salem, Raleigh, Greensboro, and Charlotte, North Carolina
- (35) Baltimore, Maryland
- (36) Philadelphia, Allentown, and Harrisburg, Pennsylvania; Camden and Elizabeth, New Jersey; Wilmington, Delaware
- (37) New York, New York; Newark and Paterson, New Jersey
- (38) Buffalo, Rochester, Syracuse, and Watertown, New York
- (39) Boston, Massachusetts
- (40) Orlando, Tampa, and Miami, Florida
- (41) Little Rock, Pine Bluff, and Hot Springs, Arkansas

Thirty-six waste treatment regions were identified, based upon the distance from the 41 major industrial waste production centers. These are shown in Figure 16. Distances of about 200 miles (322 kilometers) in the East and 250

miles (402 kilometers) in the West were selected as the maximum distances any treatment site should be from the industrial waste production centers in a given sub-region. Some of the regions do not contain an industrial waste production center; however, their boundaries are defined by surrounding regions containing waste production centers. No region was generally permitted to cross any major physiographic barrier. Notably, the regions are smaller in the East than in the West.

Criteria for site selection were defined. The major emphasis was placed on health and safety and environmental considerations. It was recognized early that two general types of sites would need to be identified: waste processing plant sites and long-term hazardous waste disposal and storage sites. Site selection criteria and numerical weightings are presented in Table 12.

Based on the site selection criteria, a ranking, screening, and weighting procedure was developed and applied to all counties located in the 36 regions which cover the country. The county-size areal unit appeared to be of manageable size for the survey. The output listing of all 3,050 counties in the conterminous United States, grouped by regional ratings, is too voluminous for inclusion here.<sup>1</sup> This listing allows for the orderly and rational selection of counties within each region, for site-specific reconnaissance, and for later detailed field studies that would be required in order to prove out the feasibility of a candidate site. From the total list that rates and ranks all counties, 74 appear to be potentially the best areas for locating hazardous waste treatment and disposal sites. These are presented as follows by State:

<i>State:</i>	<i>County:</i>
Alabama	Sumter*
Arizona	Dallas
	Yuma

<i>State:</i>	<i>County:</i>
California	Fresno
	Inyo
	Kern*
	Ventura
Colorado	Weld
Connecticut	Hartford
Florida	Alachua
Georgia	Dooley*
Iowa	Howard
Illinois	Jasper
	Livingston*
	Ogle
	Vermilion
Indiana	Jackson
Kansas	Ellsworth
Kentucky	Franklin
Maryland	Carroll
Massachusetts	Franklin*
	Worcester
Michigan	Isabella*
	Shiawassee
Mississippi	Lincoln
Missouri	Audrain
Montana	Custer
Nebraska	Kearney
Nevada	Nye*
	Pershing
	Washoe
New Jersey	Sussex
New Mexico	Eddy
	Quay
	San Juan
New York	Albany
	Onondaga
	Otsego
	Steuben

<i>State:</i>	<i>County:</i>
North Dakota	Wyoming
Ohio	Grand Forks
	Carroll
	Darke
	Wayne
Oklahoma	Atoka
	Custer
	Kay
Oregon	Deschutes
Pennsylvania	Clinton
	Montgomery
	York*
South Carolina	Barnwell
Tennessee	Greenwood
	Gibson
	Montgomery
Texas	Bell
	Erath*
	Gillespie
	Grimes
	Harris*
	Haskell
	Kendall
	Polk
	Sutton
Utah	Tooele
Virginia	Brunswick
	Caroline
	Fluvana
	Pittsylvania
	Benton
	Lincoln
Washington	Doddridge
West Virginia	Campbell
	Laramie

\* Potential site for large-size processing facility.

\* Potential site for large-size processing facility.

TABLE 12  
SITE SELECTION CRITERIA

General criteria	Weighting
Earth sciences (geology, hydrology, soils, climatology)	31
Transportation (risk, economics)	28
Ecology (terrestrial life, aquatic life, birds and wildfowl)	18
Human environment and resources utilization (demography, resource utilization, public acceptance)	23
Total	100

In addition, the following are the existing or potential Federal and State hazardous waste treatment and disposal sites:

Existing sites operated by AEC:

- Fernald, Butler/Hamilton Counties, Ohio
- Hanford Works, Benton County, Washington
- Los Alamos Scientific Laboratory, Los Alamos County, New Mexico
- National Reactor Testing Station, Bingham County, Idaho
- Nevada Test Site, Nye County, Nevada
- Oak Ridge, Anderson County, Tennessee
- Pantex Plant, Randall County, Texas
- Rocky Flats Plant, Jefferson County, Colorado
- Savannah River Plant, Aiken County, South Carolina

Existing sites operated by DOD:

- Anniston Army Depot, Alabama
- Edgewood Arsenal, Maryland
- Lexington Bluegrass Army Depot, Kentucky
- Newport Army Ammunition Plant, Indiana
- Pine Bluff Arsenal, Arkansas
- Pueblo Army Depot, Colorado
- Rocky Mountain Arsenal, Colorado
- Tooele Army Depot, Utah
- Umatilla Army Depot, Oregon

State-licensed radioactive waste sites: \*

- Barnwell, South Carolina
- Beatty, Nevada
- Hanford Works, Washington
- Morehead, Kentucky
- West Valley, New York

Data on the Beatty, Nevada; Hanford, Washington; and Morehead, Kentucky, sites are presented in Tables 13 to 15.

It should be noted that the suitability of a particular candidate site can only be determined by additional field studies, field testing, and technical analyses of the data.

\* \* \* \*

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\* The Sheffield, Illinois, site is directly licensed through AEC but is not operated by AEC.

**DEFENDANTS' EXHIBIT 57****RESUME**

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**BORN** August 10, 1943; Lakewood, Ohio

**EDUCATION**

B.S. Bucknell University, June 1965  
Advisor: Richard P. Nickelsen

M.A. The University of Texas at Austin, August 1967  
Advisor: Robert E. Boyer

Thesis: Geology and Fracture Patterns of  
North-Central Burnet County, Texas

Ph.D. Brown University, June 1971  
Advisor: William M. Chapple

Thesis: Strain in Minor Folds, Valley and  
Ridge Province, Pennsylvania

**PROFESSIONAL EMPLOYMENT**

1970-1973 Assistant Professor, Syracuse University

1973-1976 Research Geologist, Cities Service Co.,  
Tulsa

1976-1978 Senior Research Geologist, Cities Service Co., Tulsa

1978-1981 Manager, Structural Geology Research,  
Cities Service Co., Tulsa

1981-1982 Adjunct Professor, Tulsa University,  
Tulsa, Oklahoma

1981-1983 Senior Research Associate, Cities Service Co., Tulsa

1983-1986 Associate Professor, The University of Alabama

1986- Professor, The University of Alabama

Fall 1988 Visiting Chair d'honneur de l'Université de Lausanne, Switzerland

**PROFESSIONAL AFFILIATIONS**

The Geological Society of America (Fellow, 1982)

The American Geophysical Union

The American Association of Petroleum Geologists

Rocky Mountain Association of Geologists

Alabama Geological Society

Houston Geological Society

**HONORS AND AWARDS**

Fall 1988 Visiting Chair d'honneur de l'Université de Lausanne

1989-1990 AAPG Distinguished Lecturer

**DEFENDANTS' EXHIBIT 68****PERSONNEL**

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**THOMAS J. JOINER,**  
**CHAIRMAN AND CHIEF EXECUTIVE OFFICER**

**Education:** BS, MS—University of Alabama

**Experience:** 1981-Present

Chairman and founder of the firm, Mr. Joiner supervises and maintains responsibility for all geologic and engineering studies and evaluation work performed by the firm. His experience includes 25 years of working with the geology in Alabama and the southeast United States. He is very familiar with oil and gas and industrial development in Alabama, Florida and parts of Mississippi and Tennessee. He coordinates project work and preparation of reports for clients. Mr. Joiner spends much of his time representing clients before Boards, Commissions and legislative and congressional committees. He is experienced in presenting expert testimony in court and before Oil and Gas Boards and Regulatory Commissions. Mr. Joiner served as Chairman of the Technical Committee for the unitization of the Hatter's Pond Gas Field in Mobile County, Alabama for Getty Oil Company.

**1976-1981**

**State Geologist and Oil and Gas Supervisor**—Directed the program of the Survey and Board. Supervised approximately 135 people working out of 4 offices.

Programs included basic and applied research in water, minerals and energy, and environmental problems associated in the development of resources. The oil and gas responsibilities included permitting and monitoring the oil and gas drilling activity in the state and evaluating and approving completion and production procedures.

**1968-1976**

**Assistant Oil and Gas Supervisor**—Director of technical operations for the State Oil and Gas Board serving directly under the Oil and Gas Supervisor. Duties included evaluation of petitions before the Board concerning these matters. Acting on behalf of the Supervisor in routine administrative oil and gas matters. Directing field inspections and regulatory activities for the Board. Serving on energy related committees, such as the Outer Continental Shelf Research Advisory Committee, at the request of the Governor and Oil and Gas Supervisor.

**1961-1968**

**Chief, Paleontology, Stratigraphy and Geophysics Division**—Geological Survey of Alabama. Work was directly related to evaluation of geologic samples from test wells, electric logs and geophysical data to assess water, mineral and petroleum potential in Alabama. Administrative duties included preparation of agreements for cooperative projects with other State and Federal Agencies, universities, cities, counties and private industry.

**1957-1961**

**Carter Oil Company and Esso Standard Turkey Inc.**—both affiliates of Standard Oil Company of New Jersey—Duties included geological and geophysical investigations in search of oil and gas in Arkan-

sas, Louisiana, Oklahoma and a two year assignment in Turkey.

1956-1957

U. S. Geological Survey—Groundwater investigation in Alabama.

\* \* \* \*

#### DEPOSITION OF LEIGH PEGUES

\* \* \* \*

Q. Prior to your testimony before the committee, had you had any discussions with any legislators concerning this bill?

A. Yes.

Q. Would you tell me who you had had discussions with and when?

A. One time in Swift's office he called me down there, and there were some senators in the office. You probably could describe them as floor leaders, and they were talking strategy on the bill, and I was in the meeting.

Q. To the best of your recollection, Mr. Pegues, would you relate those discussions to me?

A. The discussions I had with it, I don't think they particularly asked me anything. I guess, again, I was therefore a reference person. What probably was asked of again about the six fifty. It was a typical floor leader strategy meeting, and I am not one of those.

Q. When did that meeting take place?

A. Somewhere within a week of it coming up—a week or ten days of it coming up in committee at F&T.

Q. So this would have been before your testimony at F&T?

A. That is correct.

Q. Was there any discussion in that meeting of the lowering, the possible lowering of tonnage at the site?

A. No.

Q. Was there any discussion in that meeting of the differential between in-state and out-of-state fees?

A. Yes.

Q. Tell me if you would to the best of your recollection what was said concerning the differential between in-state and out-of-state fees.

A. To the best of my recollection, the discussion was the strategy of the other side would be to make an all out attempt to make the differential larger so they could go in the court and fight it and give them a better opportunity.

Q. Do you recall what the differential was at the time these discussions were being made?

A. No.

Q. Was there any other discussion of the differential between in-state and out-of-state fees?

A. I don't know of any.

Q. Was there any discussion about lowering the amount of out-of-state waste coming into Alabama?

A. No, not to my knowledge.

Q. Was there any discussion during the Senate Finance and Taxation Committee of lowering the amount of out-of-state waste coming into Alabama by you or any of the senators while you were present?

A. You have got to be more specific on that. I don't understand. You know, we made the estimate of six fifty. What are you asking me?

Q. I am asking if during either your meeting in Robin Swift's office with the Senate floor leaders on in the Senate Finance and Taxation Committee when you testified if there was any discussion concerning the effect of the fees being to lower the amount of out-of-state waste?

A. Yes, I believe, and I think it was Senator Windom mentioned the tonnage would probably be, according to Waste Management, ninety to a hundred thousand tons, and I believe he voiced he hoped that happened. And he asked me, and I said, yes, I hope it does too. That was all.

\* \* \* \*

#### DEPOSITION OF BERNARD WEBB

\* \* \* \*

Q. Just to back up for a second, while you were working in the insurance industry, were you ever involved in any way the writing or the loss reserves or actuarial experiences with insurance for hazardous waste disposal?

A. No.

\* \* \* \*

Q. And from your recollection, what is the current status of waste disposal technology and insurance for waste disposal facilities?

A. It is currently developing. Very little actually is known right now about the effectiveness of the technological things that are used right now in the process.

Q. All right, sir. What about insurance?

A. Insurance is for practical purposes almost unavailable. That is, the insurance that is available is very limited in terms of amount. Essentially one company in the United States is writing for waste disposal facilities like Emelle. There are several others that write pollution insurance for underground storage tanks for petroleum people and things of that kind. But as far as hazardous waste disposal site is concerned, one insurer writes somewhere in the neighborhood of a maximum of ten million dollars of coverage. I have obtained different figures from them at different times, but it is all in the vicinity of ten million dollars.

Q. What company is that?

A. That's the American International Group and their principal pollution insurance company in the past has been the National Union Fire Insurance Company. They have recently formed another company which I believe is AIG Pollution Insurance Company or words to that general effect which may be replacing National Union Fire, but I am not sure of that.

Q. You also indicated you had reviewed some insurance industry publication?

A. Yes, sir.

Q. What specific publications have you reviewed?

A. I have several publications on the assessments of pollution liability risks; The Availability of Pollution Liability Insurance, Claims Administration and Pollution Liability Insurance. I think there are three published by AIRAC, A-I-R-A-C, which is an acronym for All Industry Insurance Research Advisory Committee. There is one published by the American Insurance Association which is a trade association, and one published by an industry advisory committee to the National Association of Insurance Commissioners on the availability of pollution insurance, and one published by an organization in the United Kingdom called, Insurance and Reinsurance Research Group. Although it is published in the United Kingdom, it deals with the U.S. pollution insurance exposure.

Q. What did you determine from your review of the insurance industry publications in terms of what you felt was relevant to your task in this case?

A. That insurance is not available in amounts adequate for the risk and that there is no significant competition insofar as hazardous waste disposal facilities are concerned. In other words, one company in the market. It is also very expensive. What is available is very expensive, and it is frequently written on an indemnified basis where the insured enters into a side agreement to indemnify the insurance company for any claims they pay.

Q. If it is entered on that indemnified basis from your knowledge of the insurance industry, if the insured goes belly up, the insurance company is still going to be stuck with the coverage, are they not?

A. That's correct, except they frequently require some kind of security such as a letter of credit or something.

Q. But the insurance company would not be let off the hook just because the insured's indemnity wasn't as good as they thought it was to begin with?

A. That's right. The insurance company would have to take their chances on recouping.

\* \* \* \*

Q. What were you able to determine from the Chem Waste insurance policies that you felt were relevant to your task in this case?

A. The only thing that changed anything I already knew actually was the fact that they limit some of their —their gradual pollution coverage were higher than had been indicated in the other documents I reviewed. It was ten million per occurrence and ten million aggregate rather than the three and six that I had found in other documents.

\* \* \* \*

Q. How long did you meet with Mr. Wood and the other employees at Tom Joiner & Associates?

A. About two hours. I talked to Mr. Wood on the phone at various times too.

Q. What as best as you can recall, what was the discussion in the two-hour meeting that you had at Tom Joiner & Associates?

A. The various occurrences which might result in the migration of pollutants out of the Emelle facilities into other places and possible remediation cost.

Q. Can you be a little more specific about both of those categories?

A. Yes. And probably a little more general as well. We also discussed the potential for accidents while hazardous wastes are being transported to and in some cases from the Emelle facility. We talked about the possibility of contamination of the aquifer under the Selma chalk, the possibility of earthquake damage releasing pollutants, hazardous materials, the possibility of tornado damages to the tanks, particularly the surface tanks where PCB's and leachate are stored. We also talked about the possibility of sabotage or terrorist attack on the facility, or just simple carelessness on the part of employees or mechanical failure, or the acts of a possible disgruntled

employee who might potentially release hazardous waste into the environment, things of that general nature.

Q. Would it be fair to say that this was a brain storming session?

A. To a large degree that would be a fair characterization of it. We did get fairly specific. I asked them to give me estimates of remediation cost for three specific scenarios. One would be the possibility that a tank truck loaded with PCB's would go out of control and crash in say the Warrior River releasing its cargo into the river. Another one would be the possibility that I had already mentioned of a tornado striking the tanks and scattering PCB's around the area. And the third one was the contamination of the Eutaw aquifer.

Q. Did they come up with cost estimates?

A. A range of estimates. They indicated that the cost of remediation insofar as possible to remediate in the case of the truck in the Warrior River would be measured in the tens of millions of dollars; that is, it would be somewhere between ten million and ninety-nine million. Also it would not be possible to completely remediate that because it would wash on downstream, and there would be other nonfinancial losses along the way; loss of the use of the river for various purposes, loss of fisheries, and things of that nature.

In the case of the tornado striking the PCB tanks, they estimated that at somewhere between a hundred thirty-six million, which I believe they indicated was a figure developed by somebody at Chemical Waste Management, but I don't know the details on that, up to a maximum of one and nine-tenths billion, depending on how widespread—how widely the tornado spread the PCB's. And again it would not be possible to completely remediate the damage, so it might be additional losses in terms of PCB's washing into the rivers or soaking into the soil or some of those things.

Q. What about the third?

A. The pollution of the aquifer, they did not come up with figures. They said it was virtually incalculable. It would be measured in billions, but they were not able to come up with a precise figure, that it could be many billions. Again, you have the same situation where it might be a loss of the use of the aquifer or the water from the aquifer to the extent it could not be fully remediated.

Q. Was there anything else that was discussed at this brainstorming meeting or that you had discussed with Mr. Wood in phone calls subsequent to that?

A. We have discussed in fairly general terms the possibility of hazardous waste migrating through the Selma chalk and into the Eutaw structure.

Q. Can you elaborate on that?

A. Yes. We have discussed the possibility that there may be—already be fissures or cracks, whatever you want to call them, in the chalk that might permit the migration of hazardous materials or the possibility of that since fissures might result from earthquake activity there.

Q. Have you or to your knowledge has anyone with Mr. Joiner attempted to quantify that possibility?

A. To the best of my knowledge it has not been quantified, no.

Q. Have either of the other two scenarios, the tanker truck wrecking in the Warrior River or the tornado striking the storage tanks, have the possibility of those occurrences been quantified to your knowledge by either you or anyone at Tom Joiner & Associates?

A. I don't think they are precisely quantifiable. There have been a number of truck accidents involved. I have seen a list of them, a relatively small number as I recall, twenty or so. I am not sure of the exact number right now. None of them went into the Warrior River, but it is a possibility. There have been six reported tornadoes in Sumter County between 1950 and 1989, so the probability—actually the probability of either of those happening is relatively small. It is just not something I

would anticipate happening once a year or anything like that. But they could happen. There is no way really to calculate the probability of a tornado hitting a specific small area.

\* \* \*

Q. Have you reached any opinions or conclusions regarding this particular case?

A. Yes. I have reached a conclusion that the State of Alabama has a very substantial financial exposure to possible losses arising out of the operation of the Emelle facility and that those financial losses could be into the billions of dollars.

Q. All right, sir. On what do you base your opinion first that the State has substantial financial exposure, and then later we will get into how you get to the amount of it?

A. All right. The State appears to be the pocket of last resort you might say. After everything else is exhausted, the State will probably be required to put up the money to correct any general pollution resulting from—when I say general, I mean in terms of area—resulting from the operation of the Emelle facility. Also the State will at the very minimum have the residual responsibility thirty years after the facility is closed and quite possibly before if Chemical Waste Management should become insolvent. The State of course also has other exposures besides the financial exposure in terms of the quality of life to the people of Alabama and things of that nature in the event of serious pollution arising from the facility. But the financial exposure alone could well be into the billions.

Q. Let me see. Are these really the bases of your opinion that the State has substantial financial exposure, the pocket of last resort and that it may have residual responsibilities after the facility is closed?

A. That plus the fact that I understand the State holds title to the hazardous waste that were put into the facility prior to 1985 which might give them a more immediate liability.

Q. All right, sir. In what ways, if any, do the various list of, if I can call them the list of horribles, the horrible things that can happen, how do those factor into your opinion and conclusion if at all?

A. They factor in in terms of trying to put a maximum on the State's exposure. Unsuccessful in that attempt, because we are unable to quantify the worst one of all, but trying to see what the potential exposures were given some very serious scenarios.

Q. And in coming up with the figure of a billions of dollars, is that based upon your discussions with the folks at Tom Joiner & Associates?

A. Yes. That's their evaluation or statement of potential.

\* \* \*

Q. Have you in any way attempted to differentiate in your conclusions between waste that is generated within the State of Alabama and waste that comes from outside the State of Alabama?

A. No.

\* \* \*

Q. And in your scenario number one where you had the tank truck with PCB's going into the Warrior River or you and Tom Joiner & Associates came up with a cost of remediation of ten to ninety-nine million dollars, that might well be the same if that tanker truck was loaded with some chemical product and it ran off the bridge into the Warrior River; isn't that true?

A. Depending on the chemical, it could be, yes.

\* \* \*

Q. Mr. Webb, in going back to the three scenarios that you testified to, the first scenario is about the tank truck that crashes into the river. In terms of either the relative probability of that occurring or the cost of remediation it is not going to matter from your standpoint whether that tanker truck comes from Georgia or Alabama, is it?

A. No, not at all.

Q. And the same is true concerning the tornado striking the PCB tanks? It doesn't matter from your analysis whether those PCB's came from Georgia or Alabama initially?

A. That's correct.

Q. And finally on the last scenario of horribles that you came up with, the contamination of the Eutaw aquifer, that also does not differ based upon whether the contaminant that gets into the Eutaw aquifer originally came from Alabama or Georgia or some other state; is that correct?

A. That's correct.

\* \* \* \*

Q. Now, your opinion that the State has substantial financial exposure ultimately—I think the words you used were the State is the pocket of last resort; is that correct?

A. Yes, that's correct.

Q. Would it matter in your opinion or conclusion what earlier pockets were available?

A. Yes. If the earlier pockets had sufficient resources to absorb any potential loss, then the State would have less risk.

Q. Now, I believe you indicated your general understanding of CERCLA or Superfund is that in some circumstances generators of waste may be held liable for cleanups; is that correct?

A. That's correct.

Q. Have you attempted to determine the list or a listing or a review of the generators that have sent waste to Chemical Waste Management?

A. No.

Q. Would that have an impact on your conclusion; that is, if some of these generators in fact had pretty deep pockets?

A. Depending on the extent of their contribution to the problems it might, but it is my understanding there are a large number of generators who have waste stored at Emelle. And that of course reduces the possibility of

recovering from anybody because it almost certainly would be surrounded with long and lengthy—long and involved litigation before anybody paid anything.

\* \* \* \*

Q. Mr. Webb, we were about to break, and then it appears that perhaps I have not yet elicited all of your opinions or conclusions. Have you reached any other opinions or conclusions other than the ones you have testified to earlier today?

A. Yes. There is one. I was asked what amount of insurance I would recommend the State of Alabama buy if such insurance were available. I concluded that I would recommend limits of one billion dollars.

Q. Limits of one billion?

A. Yes.

Q. How did you arrive at that figure?

A. From reviewing the scenarios that we discussed earlier and other information regarding the cost of remediation at various Superfund sites.

Q. Have you attempted to determine whether that insurance might be available?

A. It is not available.

Q. So I take it you have determined that, and it is not available?

A. That's correct.

\* \* \* \*

Q. If I ask you, Mr. Webb, to assume as a hypothetical that one of the pockets of earlier resort as we have been using the term concerning the Emelle facility is the United States of America, would that have any impact on your conclusion?

A. I think they are a reliable pocket, and therefore if they were fully responsible for it, the State would have a very small financial exposure. They may still have the exposure for quality of life and things of that kind, but their financial exposure would be very small.

Q. It certainly wouldn't be anything like the one billion dollars—again, assuming my hypothetical, it wouldn't

be anything like the one billion dollars that you testified to?

A. That's correct. In that hypothetical situation, the State would not need that much protection.

\* \* \* \*

Q. Professor Webb, you were asked a question a few moments ago about insurance at which time you opined that the State of Alabama should have an insurance policy in the one billion dollar range if such a policy were available. Do you recall that testimony?

A. Yes, I do.

Q. Do you have an opinion of the amount of the insurance premium for such a policy assuming such a policy were available?

A. If the insurance were available, I would estimate that the premium for it would be in the range of a hundred to a hundred fifty million dollars a year.

Q. How did you arrive at that estimate?

A. From looking at what is charged for what is available and general knowledge of how the insurance industry operates and how that might translate into a premium for a larger policy.

Q. You were asked questions by Mr. Wells about whether you had previously performed risk management services in the hazardous waste industry. Do you remember those questions?

A. Yes, I do.

Q. Based upon your experience as a risk manager, is it necessary for a risk manager in the insurance industry to be an expert in hazardous waste industry in order to reach the conclusions that you testified about today?

A. No, it is not necessary, because the principles of risk management that apply to hazardous waste management apply to other areas. It is simply the technical details that differ. So the risk manager who understands the principles of risk management would then rely on experts in waste management for the technical detail.

\* \* \* \*

Q. In response to questions by Mr. Wells concerning the 10-K form of Chem Waste, as I recall you mentioned that approximately thirty percent of the net worth was shown to be goodwill and that thirty-six percent of the net worth was reflected in their 10-K as land purchased at cost. Do you recall that testimony?

A. Yes, I do.

Q. What is the significance of those percentages to you insofar as analyzing Chem Waste's overall situation?

A. Those have no market value in a bankruptcy situation was the thought behind it so that in the case of a bankruptcy situation the available net worth to meet Chemical Waste Management's obligations would be reduced by at least two-thirds, quite possibly more but at least two-thirds.

\* \* \* \*

Q. So your opinion with respect to the liability the State has as a result of Emelle would be based upon the hazards only at Emelle; is that correct?

A. That's correct.

Q. And the fact that there are risks other places does not diminish the risk at Emelle?

A. That's correct.

Q. You referred to some resource books that you looked at concerning earthquakes in Sumter County?

A. Yes.

Q. Are these generally recognized as authoritative sources that you were referring to?

A. Yes, they are.

Q. And how many earthquakes do they reflect had occurred in Sumter County?

A. Only one of them mentioned earthquakes in Sumter County, and it mentioned two.

Q. Were those both in the 1986 time frame?

A. February of 1886. They were on February 4 and February 13, 1886.

Q. Excuse me. I did of course mean 1886. Are you aware of any reports that the earthquakes actually caused the ground to move up and down by a foot?

A. Yes. There was a report in the Sumter County newspaper that indicated that the ground at Moscow rose a foot and then returned to its original position. There was a report—the report in the Mobile paper indicated that it rose a half a foot, so I don't know which one of those is correct.

\* \* \* \*

Q. Mr. Webb, Are you aware of any studies subsequent to the 1886 earthquake that in any way indicate that that earthquake compromised the integrity of the Selma chalk?

A. No, sir.

\* \* \* \*

#### DEPOSITION OF RODGER HENSON

\* \* \* \*

A. My understanding is that nobody knows how long a synthetic liner will last. And I have always maintained since the outset of synthetic liners that synthetic liners are not the thing that will stop hazardous waste migration in the Selma chalk.

It is the Selma chalk itself, which is infinitely better than any synthetic liner could ever be. So I don't know how long a synthetic liner would last.

I do know that the Selma chalk has been there for 100,000,000 years, and probably will be there for at least that much longer.

\* \* \* \*

Q. What is your understanding of the length of time, currently, of the post-closure period?

A. My understanding is that it is 30 years after closure.

Q. Yes, sir.

A. My understanding may be wrong.

Q. But in other words, there is a period, which I believe is 30 years is what I have been hearing.

A. There is a period after closure of any hazardous waste facility, that is called the post-closure period.

Q. For which a company has the responsibility as mandated by EPA to be involved with the monitoring or general liability for the landfill facility?

A. That is correct.

Q. But presently, there is no law or regulation in place mandating such monitoring or control or liability of the operator or owner of the landfill facility post-closure, longer than thirty years?

A. Thirty years is the number that I am familiar with.

Q. All right. And let me ask you this: Are you aware of any funding by ChemWaste or its parent company of

post-closure responsibilities or possible liabilities for longer than 30 years?

A. No.

\* \* \* \*

A. I would say that the facility should last at least 100 years at current rates.

Q. Capacity?

A. Maybe more.

Q. Yes, sir. This is the largest, certainly the largest landfill hazardous waste burial or storage facility in the United States at the present time, isn't it, at Emelle?

A. Yes, it is.

\* \* \* \*

Q. Now with the Fee Bill enacted, and increased fees, I understand that the hazardous waste has decreased? You have covered that?

A. Yes, sir.

Q. What is the effect of that decrease upon the out-of-state current generators? What are their options now?

A. Their options are to take it somewhere else.

Q. Where it is cheaper?

A. Where the tax is less.

Q. Yes. Do they have an option also to operate their facility so as to reduce the amount of hazardous waste generated?

A. They can do that, but I suspect that is not what is happening now, because it takes time to develop those waste reductions.

Q. The waste—

A. The waste minimization programs don't happen overnight.

There is probably some of that going on.

Q. As a result of the increased fees?

A. Yes.

\* \* \* \*

There is water and it is waste at Emelle, created by rainfall.

Q. And in addition, there is leachate?

A. In addition, there is leachate.

Q. What was the cost in 1989, the approximate cost of the pumping, gathering, collection, and transportation, storage and transportation, of the ground water, waste water, or leachate as we have discussed earlier, from the Emelle facility?

A. Ten to fifteen million gallons at twenty cents a gallon.

Q. So we are talking about a total cost of approximately two million to three million dollars a year?

A. Yes.

Q. Now as I understand it, there are also monitoring costs with respect to the Emelle operation?

A. Yes.

Q. What was the extent of the approximate amounts of the monitoring costs that have been incurred with that in 1989?

A. Oh, let's say 50 samples a quarter, and those analyses will run from \$100 to \$300 per.

Q. Were there any other monitoring costs?

A. Not that I can think of.

Q. Do you have any personnel who are engaged full time at Emelle with respect to monitoring activities?

A. Yes. There is a crew of four chemists and technicians who do that.

Q. So would what be a—?

A. So technically speaking, their time, at least part of their time should be allotted to the monitoring costs. They do other things as well.

Q. What proportion?

A. Half of their time.

Q. And the facility, there is some proportion of the cost of operation of whatever laboratory it is they use; or is that included in the sampling cost?

A. The laboratory that is used is offsite.

Q. So all totaled, thinking about those items, and the payment of the offsite laboratory facilities, and appro-

priate 50 percent or whatever portion of the chemists, the four chemists' salaries and fringe benefits, et cetera, the various samples; approximately what type of costs were you speaking of in 1989?

A. Well, I don't have my calculator with me.

Q. May I give you a sheet of paper.

A. I said 50 times 4; that is about 200 samples. That is an approximation. That is based on the number of wells and how often we have to sample them. So if it costs \$100 a sample, that would be \$20,000. If it cost \$300 a sample, that would be \$60,000. Chemists time, half the chemists time; let see. If you paid him—half the chemists time would be probably another \$50,000. So that is \$110,000. I'd say \$100,000 to \$150,000.

\* \* \* \*

#### DEPOSITION OF JOHN HANLEY (PART 1)

\* \* \* \*

Q. Explain to me again—I have got away from this, and I am little vague on it now, but would you explain to me the factors as to pricing with respect to location?

A. Location, there are only in reality, even though there is some 30-odd landfills in the United States, about half of those have some kind of permitting problem or some small nature of problem, so they're not really viable. That leaves some 15. Out of the other 15, I think there are only probably eight to ten today in the entire United States, that can receive all the waste that is generated that is going to landfill.

So you basically have eight to ten landfills serving some 50 states.

\* \* \* \*

Q. What amount of cleanup would you say, what percentage of your 1989 tonnage, came from cleanup operations as you have just described, as opposed to currently generated waste? And I'm speaking of Emelle.

A. 70 to 90 percent.

\* \* \* \*

Q. It is also the opinion of industry that the hazardous waste treatment and disposal industry that the amount of hazardous waste being generated itself will certainly decrease?

A. Absolutely.

Q. Why is that?

A. There is more technology. There is better technology. There is more pressure on the industry. Ninety-five percent of all hazardous waste generated today is either recycled, detoxified, neutralized, incinerated within the facility of a process of which it is generated. Only five percent of the material ever leaves the facility to go outside to a commercial facility.

\* \* \* \*

Q. So roughly non-hazardous waste, non-PCB waste, just regular solid waste, would be about 25 percent in 1989?

A. Non-hazardous was 25 percent, PCB's were 25. RCRA waste was approximately 50, I believe.

\* \* \* \*

A. Do you want to know how many trucks come into the facility each year?

Q. (BY MR. NETTLES) Yes, in 1989.

A. 40,000—she is correct, that is close enough.

Q. So we are talking about approximately 40,000 truck loads coming into Emelle during 1989?

A. All right.

Q. On the basis of allocating the approximately 800,000 tons of waste landfilled there, and dividing that by the 20—approximately 20 tons per truck?

A. Correct.

\* \* \* \*

A. We ship aqueous waste water to Texas, to Corpus Christi. That is rainwater.

Q. Describe how that is developed or what that comes from?

A. Any rainwater that hits on any active area, any tank or roofs inside the cell, we collect and pump it all to one tank farm, a six million gallon tank farm.

And then as the rain accumulates, or the water accumulates, we ship it by truck to Corpus Christi, Texas, for disposal.

Q. Is that a ChemWaste facility in Corpus Christi?

A. Yes, sir.

Q. Approximately how many truck loads would you ship out per month, of the aqueous waste water, or rainwater?

A. We haven't shipped any in two months.

Q. Per year? What would you have handled in 1989?

A. We generally accumulate somewhere between—I think the low point was nine million, and somewhere between nine and fourteen million gallons a year of water that we collect.

\* \* \* \*

Q. In other words, this 200,000, approximately 200,000 tons of industrial waste, disposed of at Emelle last year, was industrial waste as distinguished from garbage or trees or things such as that?

A. Yes. That could have been disposed in those other landfills. In a nonregulated landfill.

Q. At that time?

A. Yes, sir.

Q. But because of the potential liability of the—

A. Of future regulation changes, they choose to come to Emelle.

Now, the back side to that is these new wastes, even though now they are hazardous by characteristic, we can treat them, take away the characteristic, and we can send them to a solid waste landfill or what you call a garbage landfill.

We can do that next week or the next or the next. Once you remove the characteristics and it's nonhazardous forever, then you can go ahead and put it in a subtitle D landfill. And that's probably what most generators are going to do.

Q. Assuming there is not some drastic current change in regulations on down the line, not presently—

A. This will clear it. This will totally clear it, because it's toxic only by characteristic, not by the definition of hazardous, so you remove the characteristic, it no longer is a hazardous waste for ever more.

Q. Explain to us the other side of the coin. What hazardous waste is there that remains hazardous even though it may be treated?

A. Once hazardous, always hazardous. That's by EPA definition. It's because the metals—that's by the chemi-

cal content of the waste. Once hazardous, it's always hazardous. You cannot ever remove the code.

\* \* \* \*

Q. I ask you to look at page 24 of the report. With respect to a strategy for addressing long-term post-closure concerns, are you aware of whether or not EPA has developed a strategic plan for addressing that issue as described in the first two paragraphs there?

A. Well, aside from that, I know that we basically are responsible for some thirty years. At the same time, we also know and recognize and accept that if EPA changes the regulations and extends that period or requires us to do something other than what is currently specified, then we have to comply with that by law and by the regulations.

And I firmly believe that our company is prepared to do that financially and in any other effort that is required. They can change the thirty years to sixty years if EPA so chooses, and we would still have to comply.

Q. I ask you to look at page 26 in conjunction with your last testimony. I think this ties in. Look at the last sentence of the paragraph there on 26 of this GAO report, Exhibit 14.

"It is generally assumed that the post-closure maintenance and monitoring period will be longer than thirty years but EPA currently does not have firm plans for extending the post-closure care period at hazardous waste facilities."

Now, I gather that sentence, at least, jives with your understanding that the present post-closure maintenance and monitoring period is no longer the thirty years?

A. Currently, it is thirty years, but we recognize that they may change that. It was some eight or ten years ago when that was made and wherever they change and wherever they move the regs, we know that we have to go with that.

It's not a secret that EPA is under some criticism from more than one source, i.e., the super fund and the

management of it and how they've done it, how they've handled their money, and that's obvious, that's in the press today.

You know, you have to pick and choose your own news articles. But, yes, I believe the company believes that it will be extended beyond the thirty years.

Q. What funds, if any, are presently being set aside to fund the post-closure maintenance and monitoring and general liabilities that may occur beyond thirty years?

A. I cannot answer that. That part of the interrogatories was prepared by one of our attorneys. And I chose not to read it before I came. Prior to that I did not know exactly where the moneys were. I've never asked the question before.

\* \* \* \*

Q. What is the purpose of the monitoring?

A. To insure that there is no migration.

Q. By migration, do you mean leakage?

A. Well, if you want to call it leakage, yes.

Q. Is that just another similar synonymous term?

A. We don't use leakage, because we don't have any. We use migration. But that's for tracking. In setting a background over a period of years to go ahead and test, the main thing that you need to do in our industry as far as monitoring is to insure that you have a great understanding of the background information.

Q. In 1989 approximately what was the cost to Chem-Waste with respect to the Emelle facility in providing the company-handled or paid monitoring services that you have described?

A. Internalized I think it's four or five—five people that—it's in excess of a million dollars a year.

Q. That would include your internal employees plus your outside consultants?

A. Yes, sir. Depends on how far you want the program to go. If you want to cover any MPDS, which is the point discharge, it has going to be tested for a water

sample and all that stuff, it could be even higher than that, because I think that consultant fee that set up was over a half a million dollars.

Q. So you're talking about over a million plus additionally—

A. Yes, it could be additions to that.

Q. —another half a million?

A. Right.

Q. I'm trying to get a handle, like on the trucks while ago, of the total cost internally or externally paid on an annual basis taking last year—

A. I would be comfortable in saying it's well over a million dollars. The numbers I can always get. I don't try to remember it but I know it's in excess of a million dollars a year.

Q. I gather probably in excess of a million and one half?

A. Yes, sir, I believe it is.

\* \* \* \*

Q. Okay. Would you agree that the higher the fee or tax imposed by the state the less hazardous waste would be sent into Alabama for disposal?

A. I wouldn't agree—I don't agree with it, but it's certainly effective in making it here that way since the tax was effected. It appears to us at this time, which is only about four or five weeks, that it has reduced our volume of business and whether portions of it are attributable to the tax or they changed the regulations, I don't know at this time. But I'm sure it has had an effect on it, yes.

Q. But you don't know the extent of that effect?

A. We don't know that yet. I think the worse month or the month that can really, will tell us how significant it is will be in October.

Q. In October?

A. I think October will be the true reflection with a significance on how significant it has been.

Q. What about September? How are the receipts running at this time?

A. About 50 percent, 40 to 50 percent of normal.

Q. Of what they were last September or what they—

A. Roughly, yes.

\* \* \* \*

Q. (BY MR. NETTLES) With respect to volumes, increases and decreases in volumes of hazardous wastes received at the Emelle facility in August thus far and September, have you noticed any increase or decrease with respect to in-state generating of hazardous waste?

A. No, none. I don't notice that that has affected in-state very much at all.

Q. Okay.

A. But it's not—in-state has never been a large contributor anyway.

\* \* \* \*

A. The most we've ever handled—most we've ever handled was about three fifty.

Q. Three hundred and fifty trucks in a day?

A. Yes, sir.

Q. What's the average?

A. The average, you know, I really can't tell you. We gave you how many loads or how many tons we did in a year. But there is no average it can be. Like right now, it's only twenty-two—twenty-three for everything all day. You know, on other days it could be around sixty or seventy.

\* \* \* \*

**DEPOSITION OF JOHN HANLEY (PART 2)**

\* \* \* \*

But basically this trench here is on automatic pumping system. And it goes underground up to this tank. In addition to that, the water that is caught through the truck wash every time we wash a vehicle, that water is captured and also goes to the tank farm.

And these buildings, which is the seven hundred and the seven oh two, anything that is contained in ramps or concrete or any of the rainfall that hits on these, it's also captured and pumped underground up to—I'm sorry—up to the tank farm.

Any active area that collects any type of liquid waste from rain or from anything at all goes to this tank farm, and that's where we store it and that's a six million gallon tank farm.

\* \* \* \*

Q. So is it not correct that to that extent, to the extent of the aqueous waste water, and particularly the leachate or waste water that is pumped out of trench twenty-one, you have ChemWaste actually being a waste or hazardous waste generator?

A. That is correct.

\* \* \* \*

Q. And so would you say that then permanent destruction of hazardous waste is not achieved through burial or disposal at Emelle?

A. Permanent destruction?

Q. Yes.

A. There is only one way known today to have permanent destruction, and it's still not permanent destruction for the entire amount of volume that's created, and that is incineration. And you still have the residues and ashes and the same thing and the same waste codes are still there and they never go away by definition of the strictest interpretation.

\* \* \* \*

A. \* \* \* But Alabama only generates sixty-eight, sixty-nine thousand tons a year.

\* \* \* \*

Q. As I understand it from ADEM docket number OA50 there were some eleven spills at the Chemwaste facility at Emelle in 1989? At or involved with the Emelle facility?

A. That's possible. Keeping in mind that a spill could be less than a pint.

\* \* \* \*

Q. Now the records we have indicate there were only two spills in 1988, one in 1987, two in 1986, two in 1985 and one each in 1984 and 1983?

A. Okay.

Q. Assuming the accuracy of that and assuming that there were in fact eleven spills in 1989, do you have any opinion as to the reason for the increase in spills in 1989?

A. Two reasons. Number one, there was a greater awareness on our part internally from our policies and procedures of reporting everything. It's just like in accidents and incidents or anything else, we have an incident review board that meets every Friday morning, that covers every incident you can think of that may have occurred on that site, whether safety, environmental or whatever. And we review these each week.

What may not have been reportable in '83, '84, '85, '86 now is certainly reportable within the site policies and procedures. And then those that are currently reportable by quantity to ADEM or EPA.

Certainly there is a greater awareness of that also. And I think those two reasons is the reason that you may see a significant increase in those reportable quantities. Many of the reportables in 1989 primarily should have been charged to some of the transporters, not Chemical Waste at that facility because we were doing the reports and signing them.

This year we've made a different procedure. If a transporter brings it in and it's leaking, it belongs to him. He must report it himself.

Q. This part of the year so far, how many spills reportable or attributable to Emelle, to the ChemWaste operation of Emelle, how many to your knowledge have you required to be reported by the transporter?

A. I don't want to venture off the top of my head. I know the number of spills that we have had.

Q. How many?

A. Relatively small, three or four I think.

\* \* \* \*

A. \* \* \* All of the geologic studies that we do and all of the information that we receive—you've got to understand these—it's only been ten years since this whole industry started.

People are continuing to learn about leachate and water pressures and secondaries. They don't even know how to estimate this. Nobody does. So there are studies ongoing every day all across the United States, not only at ChemWaste, about how all of those things function.

And as things change, as the regulations change, as our information from our own consultants becomes better or over a longer period, then we all have to listen to that and do what we think is best. But there is not a definitive answer.

If there is a definitive answer, it needs to come from an expert consultant. But we are very flexible with that and we continue to study those numbers.

Q. And as you said the technology is constantly improving?

A. Absolutely.

\* \* \* \*

Q. Is it your testimony then that in your opinion Emelle is a safe site because of the fact that ADEM and EPA are monitoring it and that they are requiring that whoever operates it operate it in accordance with their existing regulations?

A. That's a portion of it, yes.

Q. But you do recognize that the state of art is always changing with respect to the hazardous waste industry?

A. The state what?

Q. The state of the art is always changing with respect to the hazardous waste industry?

A. Yes, sir.

Q. That all the environmental risks may be imperfectly known at this time?

A. That's a possibility.

Q. Now, you said that you have had a reduction in the amount of waste brought to Emelle in the past month or so since the fee act became law?

A. Right.

Q. The effect of that is, would you agree, to cause the generators of waste to seek other means of either disposing of waste or means of minimizing the waste that they generate?

A. I've stated once before that ten percent of what we call generators or owners contribute ninety to ninety-two percent of all the waste that comes to our facility.

Those are clean-up projects. These are wastes and contaminated soils that have been generated over the last fifty or sixty years before there was any recognition that the environment was being contaminated or lands were being contaminated.

The generators of today in the last five years have done a heck of a job in minimizing their waste. Only five percent of all the waste generated in the United States ever leaves the facility in which it is generated.

The other ninety-five percent is recycled, neutralized, detoxified, or whatever. It's the clean-up from fifty years that generates the mass volumes of waste.

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**DEPOSITION OF WILLIAM BRUMUND**

\* \* \* \*

Q. So am I correct in saying that the Love Canal and the problems resulting from the Love Canal cleanup in the mid and late 1970's really was sort of a catalyst for the development of what we now look upon as hazardous waste technology and regulations?

A. It certainly focused the nation's awareness on a particular set of problems which probably had not been addressed directly before.

\* \* \* \*

Q. In your opinion, would you think—Based upon your expertise, your education, your background, and knowing generally, I assume, the topography of North Carolina, in your opinion would there somewhere within the state of North Carolina be a site that would be appropriate—meet the various regulations and design for government and design standards necessary for the investment a commercial hazardous waste landfill?

A. I think that from an engineering standpoint, you can engineer a facility to meet the regulations for a hazardous waste facility in North Carolina.

Q. Would that be true of most of the states in the United States?

A. I think so.

Q. Can you think of any states generally that it would not be true of?

A. When you say meets the regulations, probably not, but I think there are some states which are not well suited to the disposal of hazardous waste because I fundamentally believe in geologic containment as opposed to engineer containment.

Florida, which is a sandbox, has high groundwater table, and water is a precious commodity down there. Saline-free water is a more vulnerable area from the standpoint of locating hazardous waste facilities.

Q. How about North or Northwest Florida?

A. It starts to get better, but there's a lot of Florida that isn't that way.

Q. But do I understand you correctly that in your opinion that aside from the engineering aspects from the natural sites that would be available, that generally in every state of the United States, there would be a suitable landfill site available for the disposal of hazardous waste in the landfill operation?

A. Well, I'm uncomfortable trying to generalize like that, I think that, as I said, given a site somewhere in a state, a design can be developed to meet the current standards. Whether or not it's as good as sites in other states, we have to look at the specifics of each.

Q. Do you think there are sites available in other states as good as the one at Emelle for the disposal, burial, storage of hazardous waste landfill?

A. Well, of the sites I've seen in the United States and elsewhere in the world, I think Emelle has many desirable features. It has a lot going for it. In my opinion, it's one of the best geologic sites I've ever seen.

\* \* \* \*

Q. Is it not correct that hazardous waste and the storage of hazardous waste generally presents a greater environmental risk or problem on the one hand than the disposal landfill of solid waste on the other?

A. I'd say so, yes, sir.

Q. Solid waste landfills by definition do not accept hazardous waste for disposal?

A. They're not supposed to.

\* \* \* \*

Q. All right. Is chalk a natural—a good natural source of groundwater?

A. No.

Q. Why?

A. Because it's relatively impermeable. The chalk at this site is tighter than Dick's hat band.

\* \* \* \*

Q. What is leachate?

A. It's the liquid that exists in a trench within the catchment area in which hazardous wastes are placed.

Q. What type of liquid?

A. Well, rainwater if it falls within the catchment area of anything where hazardous waste is placed. It's defined regulatorily as leachate.

\* \* \* \*

A. Those early trenches were shallow and unlined. I do not know—As I said before, I haven't seen this drawing before I came in here just a few minutes ago.

Q. I understand. But at the same time, I need to know what you do know. If you don't know something, that's fine. But for obvious reasons we want to be as thorough as we can. If you don't know something, just tell us, and we'll go on—we'll just ask you impressions or go on to another area.

But let's go back. Is it your testimony that you do not know whether there's been any migration of groundwater or liquids from Trench 6 to Trench 7?

A. I do not know if there's been any migration from Trench 6 to Trench 7.

Q. Has there been, so far as you know, any hydraulic connection between those two trenches, 6 and 7?

A. As I mentioned, all of those earlier trenches were unlined, and they're fairly shallow and fairly near the ground surface. It would not surprise me therefore if there was an inner connection.

Q. How would that—why do you say that, that it would not surprise you if there had been some migration?

A. Because I talked to you earlier about the fact that the upper portion of the Selma chalk in places, exhibits staining along the discontinuities.

Q. That's the top one hundred and sixty feet?

A. Yeah. These trenches are all fairly shallow, as I recall, probably less than thirty feet deep. And they were not excavated, I don't believe, very deep below

ground surface; so there probably is some inner connection between those trench walls. They're in close proximity with one another.

Q. Would that likewise—if that were the case, would there not be the possibility of migration, hydraulic migration, outside the trenches going to the north?

A. Well, it depends—This suggests that there is a modest gradient in the chalk to the north.

Q. So what would be the answer to the question?

A. Fluid could move along these near surface defects in the downgrading direction.

Q. Is it your opinion that liners would retard the fluid migration?

A. In a short term.

Q. What are you speaking of in a short term?

A. Until the liner no longer serves—no longer is an intact and relatively and permeable membrane.

Q. What period of time would that involve in your opinion?

A. It depends on the leachate. It depends on the nature of things. It's probably in terms of tens of years, not thousands of years.

\* \* \* \*

Q. Now, you mentioned your opinion or you made a statement with respect to there being a travel time of ten thousand years. What do you mean by that, sir?

A. I think it's explained in that report. It has to do with the time it would take a drop of water leaving the bottom of a trench at Emelle to make its way to the top of the Eutaw aquifer.

Q. And is it not correct that you and Golder Associates estimated that it would take ten thousand years for fluid to migrate from the Emelle facility down into the Eutaw aquifer?

A. I think we are just saying the same thing. I mean I thought that's what I just said.

\* \* \* \*

Q. What, if any, estimates have been made that you might recall with respect to travel time, through the lateral travel time through the Selma chalk?

A. My recollection is that the lateral flow estimates to surficial waters like Bodka Creek and elsewhere or in the same order of magnitude as the flow to the Eutaw largely because the gradient is so low.

\* \* \* \*

Q. In your opinion at the present time, are there adequate monitoring wells measuring lateral movement, if any, at the Emelle facility of fluid or hydro-geological movement?

A. I believe there are yes, sir.

\* \* \* \*

A. Those cells which are unlined below the water table, they will be leachate because of insufficient rainfall during operation. This will take a while for that to be pumped out. After a cover is put on, you're going to have infiltration from the surrounding water table. So you are going to get seepage. You're going to get inflow which can be pumped out. It's really groundwater which flows into the trench.

Q. And it becomes contaminated?

A. During this whole process, everything is coming in, nothing is going out. So leachate will be generated because of close flow into the facility. And that's going to happen in all these facilities. Now, there were different things in the lineament themselves, but the situation basically is during operation and during the closure period. And flow will be into the facility.

Q. Well, would there be—I assume that the cells are closed or capped off. Would there continue to be generation of some leachate?

A. The movement—I assume you're talking about—Leachate means water. There will be inflow groundwater. So yes, there will be liquid in the trenches.

Q. Which is preferable in your opinion?

A. When it's removed, you always have the inward grading. So that eliminates the problem of exfiltration. If in the future you choose not to pump it and the gradient surrounds the chalk, then you will have a downward grading from the trench or some of the surrounding chalk. As soon as the water level in the trenches is in excess of a hundred and forty, there's going to be a downward grading of seepage, low pressure, depending on the slope of the groundwater moving away from the facility. The gradient at this site are very slow, very small. So you have to look at the slope, the groundwater table, the head in the Eutaw. You have to pay attention of which flow in and what direction at what point in time.

Q. In your opinion, would it be advisable from an environmental standpoint after closure to continue to remove leachate from the trenches?

A. I think that's more a matter of public policy. I think this site will be contained and will be diminimous downward and the trench equilibrate. If public policy suggests it, it should be. If you're going to have inward seepage, you would reduce the tendency for any.

Q. Again just in simple terms, do you have an opinion as to whether it would be preferable to continue the removal of leachate after closure?

A. If one wishes to continue to have a belt/suspender operation, pumping leachate provides an additional measure of protection.

Q. I must ask you, what do you mean by belt/suspender operation?

A. This is not a term that's used in Alabama?

Q. It's one I haven't heard of before. Possibly all the rest of the people have.

A. If you're interested in not having your britches fall down around your ankle, you can put a belt on. You can wear suspenders. It provides additional protection from having your trousers falling down.

We're interested in keeping the environmental trousers from dropping down. If you're not comfortable with your

belt, so you're going to wear suspenders; elements of protection. Provide an additional element of protection against exfiltration.

\* \* \* \*

Q. So as far as you know, has ChemWaste, your company ever collected any surface water samples from Bodka creek or flowing well south of Bodka creek north of the facility?

A. I believe they have.

Q. Do you know whether anything, any contamination has ever been detected in those samples?

A. I do not believe it has.

Q. One more question on leachate. Will leachate continue to form or leak from a closed cell?

A. Is that a generic question or at this site?

Q. At this site.

Q. Will leachate continue to be generated at this site?

Q. Yes, sir.

A. Yes. Because those trenches are below groundwater level, you will have some either in equilibration or flow.

\* \* \* \*

Q. You spoke a while ago of cleaning up contaminated water around the Selma chalk. What would you recommend or think to be the most appropriate method on cleaning up any contamination? We spoke earlier of cleaning up contaminated groundwater. That may at some future time get into the aquifer. Do you have any opinion as to the best method or methods of cleaning up any contamination that may get into the Selma chalk or would that even be appropriate to undertake remedial action efforts at that point?

A. I think it would depend on how close to the surface it is. If it's real close to the surface, it maybe difficult. If you can regress it further, it might.

\* \* \* \*